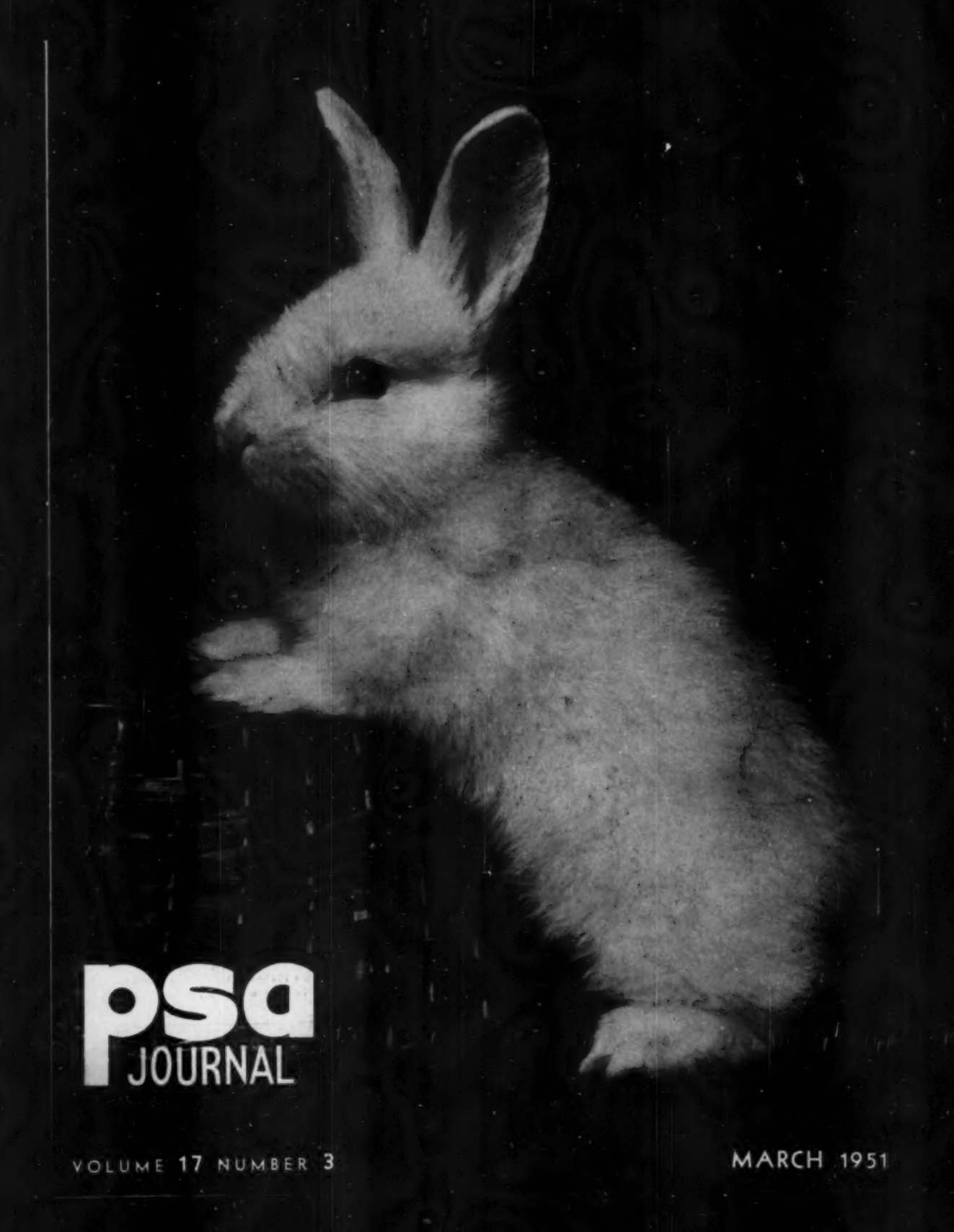
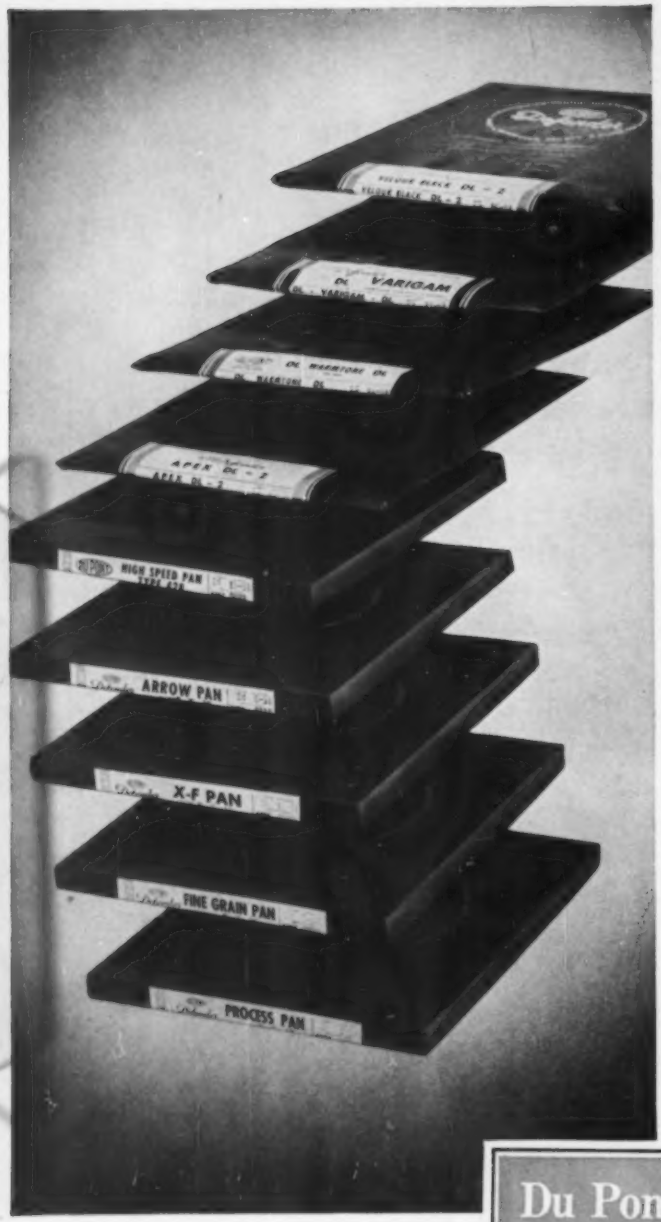


# psa JOURNAL

VOLUME 17 NUMBER 3

MARCH 1951

# HOW TO GIVE YOUR PICTURES A *Professional Look* OF QUALITY




To assure finest work at all times, many photographers use these dependable Du Pont Photographic Products exclusively:

**"VELOUR BLACK" PHOTOGRAPHIC PROJECTION PAPER** — favorite professional enlarging paper with sensitive emulsion that reacts to slightest differences in negative density. Grade 1 Soft . . . for contrasty negatives. Grade 2 Normal . . . for average negatives. Grade 3 Medium Hard . . . for flat negatives. Grade 4 Contrast . . . for extremely flat negatives.

**"VARIGAM" VARIABLE CONTRAST PHOTOGRAPHIC PAPER**—a unique paper providing ten degrees of contrast by selection of the proper filters. Basic 5A Set of Filters; Supplementary 5B Set; Complete Set 10C.

**WARMTONE TYPE 9034**—an entirely new projection paper. Gives you rich and radiant pictures with soft, warm tones. Its toning properties are superb. Already a favorite among leading professional photographers.

**"APEX" PHOTOGRAPHIC CONTACT PAPER** — a popular commercial and photo-finishing paper available in nine surfaces and six degrees of contrast. Professional "Apex" in surfaces BB, DL, EL and Y is ideal for warm-tone portrait work.

**HIGH SPEED PAN—TYPE 428**—produces top-quality negatives under the most adverse lighting. Permits extremely fast shutter speed or stopping way down for depth and sharpness. ASA daylight 160; tungsten 125.

**"ARROW" PAN**—high speed; high red sensitive. Ideal for mass portraiture with daylight or fluorescent lighting and flash exposures. ASA daylight 125; tungsten 80.

**"X-F" PAN**—medium speed; medium-fine grain; normal scale. Balanced color sensitivity. Best suited to studio portraiture and illustrative photography with tungsten light. Recommended for color separation negatives. ASA daylight 50; tungsten 32.

**FI NE GRIN PAN**—maximum speed consistent with fine grain. Balanced color sensitivity. Ideal for murals and specialized uses in industrial and scientific photography; photomicrography; commercial copying. ASA daylight 32; tungsten 20.

**PROCESS PAN** — extremely high contrast for line work; copying. ASA daylight 16; tungsten 10.

**TESTED CHEMICAL PREPARATIONS:** 53-D — All Purpose Developer • 54-D—Cold Tone Paper Developer • 55-D—Standard Paper Developer • 16-D — Film Developer • 16-DR — Replenisher for 16-D Developer • 1-F — Acetic Acid Fixer • 11-F — All Purpose Fixer • Wash Test Solution for checking hypo elimination after washing.

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*Ansco Direct Sepia Toner* is especially formulated to give you beautiful warm sepia tones on Ansco Cykora and similar medium-speed papers. Direct Sepia Toner comes in 4 and 16 ounce bottles of concentrated solution. Dilute one part toner with 50 parts of water and tone your pictures in one simple, rapid, direct operation. There is no previous bleaching, no redevelopment.

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# psa JOURNAL

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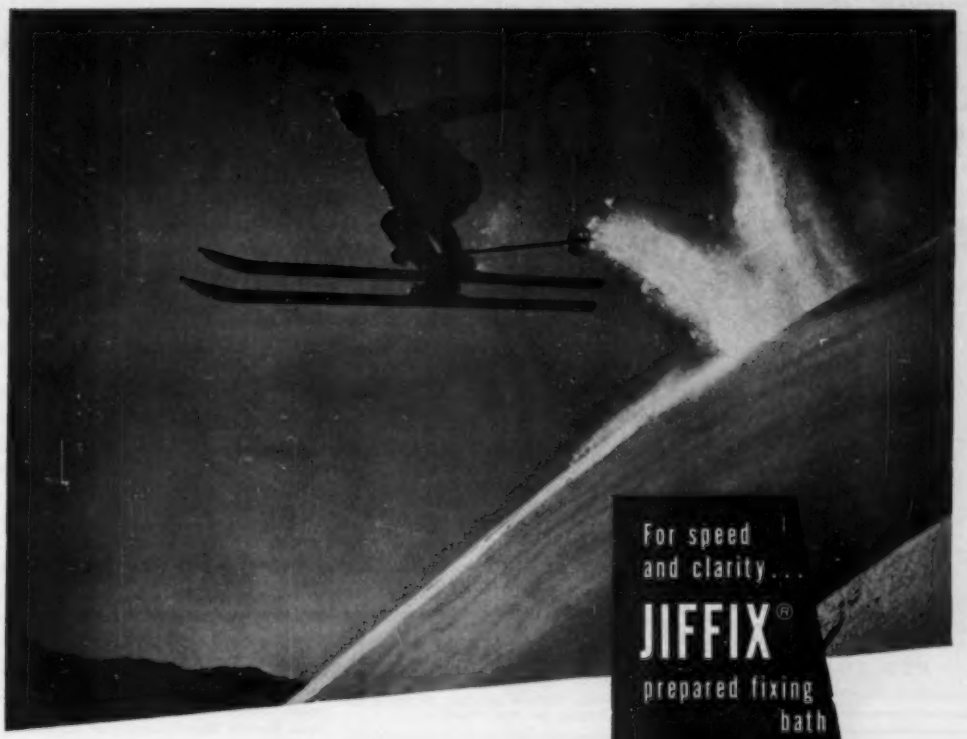

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## TECHNOLOGY . . .

AMATEUR PHOTOGRAPHERS and, especially, the pictorialists, pretend to eschew the technical phases of photography with the thought that they are concerned only with esthetics. Still, even the most artistic amateur can find in PSA JOURNAL's technical articles and sections an occasional bit they can read, understand, and apply with benefit.

CASE IN point is the recent technical article on photographing the interior of railroad cars. On the surface it has, at the most, limited appeal. But those who will read Herbert Meyer's article in November 1950 *Photographic Science and Technique* even so far as the fourth paragraph will learn something to their advantage.

FOR INSTANCE, Meyer found that Hollywood's photographers, asked to comment on how to photograph railroad cars, "insisted upon the necessity of first analyzing the psychological effects that are expected to be conveyed photographically." Instead of thinking about camera, film, lights, exposure, and other routine, these skilled photographers wanted to know what human emotion the picture was designed to stimulate!

HERE IS a basic approach to photography. What is the *purpose* of the photograph? What is it supposed to *do*? Any amateur who will follow that line of thought and action will find himself on the path to photographic success. He will be making not merely photographs, but pictures. Pictures which cause emotional reactions, pictures which viewers will admire not merely because they are good technically, but because they do something and mean something.

PERHAPS HERE, in thinking before the picture is made, in advance planning for effect, in forethought as to how the picture will affect people, is the key to purposeful photographs.—VHS

## PSA CONVENTION

**Detroit, Michigan, October 10–13, 1951**

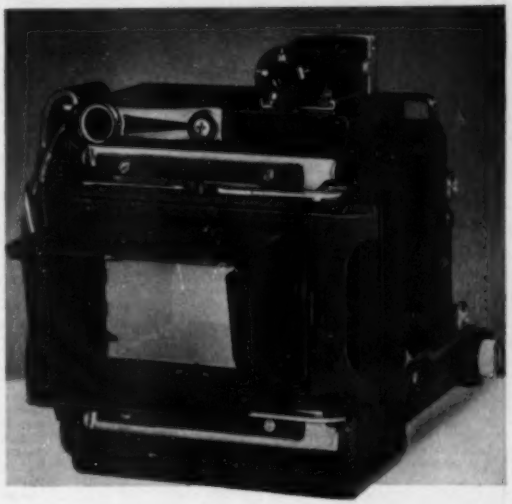
*Here's What's Back of Graphic Versatility*

# THE GRAFLOK BACK!

Here's just one more reason why Graphic cameras are known the world over for their complete versatility. It's the famous Graflok back, which is standard equipment on all Graphics, the Century, the Pacemaker Crown, the Pacemaker Speed, and may be fitted to earlier model Graphic cameras.

***What is the Graflok back?*** It's a new camera back that combines the best features of the Graphic and Graflex backs. It has a spring-loaded focusing panel that is instantly removable to permit the use of the new film receptacles that can be firmly attached to the camera by the built-in slide locks.

***Widest film choice.*** This new back accepts all Graphic film attachments including the film pack adapter, sheet film holder, roll film holder and Grafmatic film holder. This means with Graflok you have the widest choice of film and emulsion types offered by any camera—but that's not all!



***Grafmatic adds speed.*** For added speed and convenience with any 2¼ x 3¼ Graphic or Graflex camera just use the new Grafmatic holder! This compact, lightweight sheet film holder is no thicker than a film pack adapter, yet it permits six exposures in rapid-fire sequence, cycles in a flash, works faster than most roll film cameras. It's ideal for sports and news sequences, wedding shots, industrial studies, and many other picture-series jobs.

***Graflarger for enlargements—plus!*** For a compact, *portable* enlarger, at amazingly low cost, just add the new Graflarger with Aristo Cold Light Pack to your camera! Here's a lightweight source of color-balanced cool light that will not harm negatives, fade color, or damage camera or lens. Perfect for the traveling cameraman; fine for cramped quarters. Useful, too, as a retouching stand and transparency viewer. Fits all cameras equipped with that wonderful Graflok back! Also adaptable to Graphic and Graflex backs. Ask to see the handy Graflarger stand—perfect for copy work too!

***Roll Film holder for economy.*** For real economy and even greater film choice, you'll want the new Roll Holder, that lets you use the popular, economical 120 roll film, black and white or color. Available in three sizes, 2¼ x 3¼, 3¼ x 4¼, 4 x 5. Attaches directly to cameras with Graflok back, can be adapted to other cameras too,* two models, Graphic and Graflex and, two sizes for eight 2¼ x 3¼ or twelve 2¼ square negatives on every roll. A further increase in film choice, a great money-saver, especially with color film!

**The famous Graphic Cameras . . . the Century . . . Pacemaker Speed . . . Pacemaker Crown.** Packed with features that have made them the favorites of professionals and amateurs everywhere. Versatile all-purpose cameras designed to take a wide variety of accessories such as those shown here . . . all equipped with ground glass focus, Graflok back, built-in flash synchronization, rising, shifting, and tilting front and fine lenses. Rugged, dependable, and priced from $109.50.

* All Graphic cameras accept the roll film holders with the Spring Clip Kits. Ask your Graflex Dealer about this today!

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- ☐ Crown Graphic
- ☐ Century Graphic
- ☐ Graflok Back
- ☐ Roll Holder
- ☐ Grafmatic
- ☐ Graflarger

Name .....

Street .....

City ..... Zone ..... State .....

# DRIVE OF CHAMPIONS

## FLASH

Here's red-hot news for all participants in the Drive of Champions.

To those who turn in the greatest number of individual members during the month of April, the following outstanding pictorial pictures by well-known PSA members will be given as awards. Each of these prints is mounted on a 16" x 20" mount and is suitable for framing by you if you wish to hang it in your home. Each print is signed by the maker and is an original.

Winners will be chosen on the basis of the largest numbers of new members sponsored by Drive participants and received at PSA Headquarters during the month of April prior to May 1, 1951. Winners will be allowed to choose their prints with first choice going to the person with the largest number of new members during the month.

| | |
|---|---|
| Arthur M. Underwood | "Reaching" |
| | "Port Tack" |
| C. B. Phelps, Jr. | "Sleeping Beauty" |
| | "Body & Soul" |
| Ollie E. Romig | "Skating Panther Hollow" |
| | "Twilight Down the Ohio" |
| Al Watson | "Larva" |
| | "Struggle" |
| | "Tank Pattern" |
| | "Peeper" |
| Leon Forgie | "Roof Tops" |
| A. A. Bodine | "She Leans" |
| | "Sunrise Ballet" |
| | "Dispersion of Light" |

### *Activity in India*

The following is quoted from a letter received from Mr. K. M. Banerji, Nagpur, India. Mr. Banerji joined PSA in August 1950.

"I am in receipt of your very encouraging letter of the 4th October, 1950 for which please accept my heartfelt thanks.

"You may rest assured, I shall do my bit from my area to the best of my ability.

"In spite of devaluation, which means near about Rupees five for a dollar, I have yet to see a photographer who refused to become a member of the PSA at the first suggestion!

"All I have to do is to hand over a copy of the PSA JOURNAL for a cursory glance and emphasize the fact that it is only 5 dollars for our country for 12 issues of this wonderful magazine which includes a bumper Annual number. That is all.

"But I have to be careful in selecting a member who will not only sign at the first sight but continue to remain a PSA member for years to come.

"Herewith eight more new members."

### *Drive of Champions Tally*

*As of February 15, 1951*

| *State* | *Name* | *Points* |
|---|---|---|
| *District No. 1* | | |
| Maine | Augusta Camera Club | 1 |
| New Hampshire | Benjamin Thomas | 1 |
| Vermont | None | 0 |
| Massachusetts | Cecil B. Atwater | 1 |
| | Rudolph C. Born | 1 |
| | Albert L. Brooks | 1 |
| | Lee A. Ellis | 4 |
| | Mrs. Ira L. Goding | 1 |
| | Clark W. Goodchild | 2 |
| | Capt. W. H. Greenhalgh Jr. | 2 |
| | Ralph A. Hammann | 1 |
| | Hutson K. Howell | 3 |
| | Franklin I. Jordan | 1 |
| | Mrs. Barbara Standish | 1 |
| Connecticut | Edward Hutchinson | 1 |
| | Raymond J. LeBlanc | 1 |
| | Hy Schwartz | ½ |
| | Paul A. Sperry | 20* |
| Rhode Island | None | 0 |
| *District No. 2* | | |
| New York | Bernard M. Acosta | 13* |
| | Paul Arnold | 2 |
| | Perry Atkinson | 1 |
| | Edward L. Bailey | 1 |
| | B. E. Buckley | 2 |
| | Willard H. Carr | ½ |
| | T. Anthony Caruso | 1 |
| | Earl R. Clark | 1 |
| | Charles H. Coppard | 1 |
| | R. M. Corbin | ½ |
| | John H. Dessauer | 1 |
| | William J. Dewhirst | 7* |
| | Catharine E. Door | 1 |
| | Thomas W. Drew | 1 |
| | George Eaton | 3 |
| | Robert F. Edgerton | 2 |
| | David B. Elsendrath Jr. | 1 |
| | Mrs. Franke Fassbender | 10* |
| | Howard E. Foote | 2 |
| | W. R. Franklin | 1 |
| | Richard W. Henn | 1 |
| | William R. Hutchinson | 1 |
| | Charles A. Kinsley | 2 |
| | Paul J. Koehler | 2 |
| | Dr. Bernhard Landow | 1 |
| | Daniel J. Lawrence | 2 |
| | Norman Lipton | 1 |
| | Rev. Boyd A. Little | 9* |
| | John H. Magee | 41* |
| | Margo Studio | 1 |
| | R. B. Martenson | 11* |
| | Hugo Maugeri | 1 |
| | Arthur S. Mawhinney | 1 |
| | Herbert McDonough | 1 |
| | Metropolitan CC Council | 1 |
| | Walter S. Meyers | 1 |
| | Lowell E. Muehler | 1 |
| | John G. Mulder | 87** |
| | J. Stanley Nixon | 2 |
| | Frank Nolan | 1 |
| | H. Paschel | 1 |
| | Martin Polk | 3 |
| | H. C. Radon | 1 |
| | Harry R. Reich | 2 |
| | Norman Rothschild | 1 |
| | Ralph Samuels | 1 |
| | Walter Sarff | 1 |
| | E. G. Sargent | ½ |
| | V. H. Scales | 2½ |
| | Irving Schlackman | 1 |
| | Earle Schwartzott | 1 |
| | Fenwick G. Small | 1 |
| | Howard E. Smith | 1 |
| | Harold B. Spriggs | 1 |
| | W. F. Swann | 1 |
| | Silas M. Thronson | 3 |
| | Charles H. Tipple | 1 |
| | Ruth E. Tremor | 1 |
| | Dr. E. P. Wightman | 20* |
| | Edward C. Wilson | 2 |
| | Paul J. Wolf | 1 |
| New Jersey | Roy J. Bohlen | 1 |
| | H. R. Caler | 1 |
| | Russell E. Darby | 1 |
| | Howard C. Duncan | 1 |
| | Louis Lehman | 1 |
| | James F. Monteverde | 1 |
| | George J. Munz | 1 |
| | Leonard Ochtman Jr. | 1 |
| | H. D. Sheldon | 10½* |
| | Dennis A. Simonetti | 1 |
| | Carlyle F. Trevelyan | 1 |
| | W. L. Woodburn | 1 |
| *District No. 3* | | |
| Pennsylvania | F. Ross Altwater | 1 |
| | R. S. Beese | 1 |
| | Rev. H. Bielenberg | 1 |
| | Harvey H. Boarts | 1 |
| | Wilson R. Browne | 1 |
| | P. J. Cancelmo | 2 |
| | Philip Cass | 77** |
| | Arlene H. Daniels | 1 |
| | Dr. Francis Ashley Faught | 1 |
| | G. A. Hampfler | 1 |
| | Nelson Hutchison | 5* |
| | George F. Johnson | 3 |
| | P. Kissinger | 1 |
| | Richard R. Koch | 51½** |
| | Mrs. Janet Leathem | 1 |
| | S. Miller Mack | ½ |
| | Foster Moyer | 4 |
| | L. V. Platt | 1 |
| | F. Quellmalz, Jr. | 98** |
| | O. E. Romig | 1 |
| | Jesse Weiss | 1 |
| | Paul J. Wolfe | 3 |
| | Asa L. Young | 2 |
| Delaware | E. T. Howell | 1 |
| | A. K. Pfister | 1 |
| | Harold W. T. Purnell | 3½ |
| Maryland | Mrs. Caryl R. Firth | 3 |
| | Tom Firth | 6* |
| | Alex G. Potamianos | 1½ |
| | W. G. Schepleng | 1 |
| | Oliver C. Shipley | 1 |
| | E. V. Wenzell | 2 |
| D. of Columbia | Mrs. Bettie Z. Fahnestock | 1 |
| | C. H. Severance | 1 |
| | Harry B. Shaw | 1 |
| Virginia | Capt. F. C. Allen | 1 |
| | Ollie Atkins | 2 |
| | William Edwin Booth | 1 |
| | Camera Club of Richmond | 3 |
| | Dr. J. O. Fitzgerald | 1 |
| | T. P. Holt | 9* |
| | Old Dominion CC | 1 |
| | Charles C. Peterson | 1 |
| West Virginia | Mrs. Louise A. Geisel | 1 |
| *District No. 4* | | |
| Ohio | A. Millard Armstrong | 2 |
| | Axel Bahnsen | 2 |
| | James A. Blaes | ½ |
| | Frank E. Carlson | 2 |
| | Jack Clemmer | 1 |
| | R. C. Hakanson | 2 |
| | E. J. Hobbs | 1 |
| | Herbert M. Howison | 1 |
| | Miss Stella Jenks | 1 |
| | Charles M. Kyle | 1 |
| | J. Robert Langlotz | 6* |
| | Edward B. Noel | 4 |
| | A. L. Paschall | 1 |
| | P. H. Oelman | 2 |
| | Albert M. Simpson | 1 |
| | Miss Sidney Thomas | 4 |
| | Doris M. Weber | 41* |
| | J. G. Whetson | 2 |
| Indiana | Mrs. Irma G. Haselwood | 1 |
| | Mrs. Frank Hoke | 1 |
| | Robert L. McFerran | 6* |
| | Harvey P. Rockwell, Jr. | 1 |
| Kentucky | French Patterson | 1 |
| | E. G. Zanone | 1 |
| Michigan | Roland N. Anderson | 1 |
| | J. Elwood Armstrong | 9* |
| | Isadore A. Berger | ½ |
| | Earle W. Brown | 9* |
| | Lyall F. Cross | 2 |
| | Mrs. Jean Elwell | 1 |
| | Audrey Gingrich | 3 |
| | Belle McMillen | 3 |
| | R. H. Nichols | 1 |
| | Mrs. Constance L. Phelps | 1 |
| | Harry Perry | 3 |
| *District No. 5* | | |
| Tennessee | Miss Eugenia Buxton | 6* |
| | Lester D. Cohn | 1 |
| | Thomas F. Gaines | 1 |
| | Herbert Jackson | 22* |
| | Allison V. Slagle | 3 |
| Georgia | C. F. Luce, Jr. | 3 |

| State | Name | Points |
|---|---|---|
| Florida | C. Verne Klintworth | 3 |
| Alabama | H. Jack Jones | 1 |
| | Prescott V. Kelly | 4½ |
| Mississippi | J. M. Endres | 3 |
| North Carolina | Melvin F. Cipar | 2 |
| | William A. Ramsey | 1 |
| | Hoyt L. Roush | 5* |
| South Carolina | Hugh F. Walburn | 2 |
| *District No. 6* | | |
| Louisiana | Wood Whitesell | 9* |
| | A. E. Woolley, Jr. | 2 |
| Arkansas | Allan M. Thomas | 1 |
| Missouri | Stuart M. Chambers | 61** |
| | W. E. Chase | 4 |
| | B. E. Emerson | 1 |
| | Martin B. Manovill | 1 |
| | Alfred S. Norbury | 3 |
| Kansas | Dr. H. E. Morgan | 1 |
| | C. R. Romstedt | 1 |
| | Dan B. Rumpf | 1 |
| Texas | Samuel F. Davis | 2 |
| | Eugene C. Doehne | 1 |
| | Paul Linwood Gittings | 2 |
| | Ralph E. Gray | 2½ |
| | Lloyd L. Gregory | 3 |
| | Dr. L. L. Handly | 3 |
| | C. J. Perry | 5* |
| | W. F. Reeves | 1 |
| | Carlos Sandoval | 1 |
| | F. J. Schmidt | ½ |
| | CWO Frank I. Yates | 7* |
| Oklahoma | G. E. Fiellin | 3 |
| | Frank J. Heller | 3 |
| | John Long | 1 |
| *District No. 7* | | |
| North Dakota | None | 0 |
| South Dakota | E. C. Lugg | 1 |
| Nebraska | Sten T. Anderson | 2 |
| | Richard C. Knott | 1 |
| | Stanley D. Sohl | 5* |
| Illinois | Rus Arnold | 4 |
| | Egon Berka | 1 |
| | George W. Blaha | 1 |
| | Dwight M. Chambers | 4 |
| | Mrs. Evelyn Chambers | 3 |
| | Dr. Edward Chips | 5* |
| | Eldridge R. Christhilf | 4 |
| | Clifford B. Cox | 1 |
| | Miss Miriam Davey | 2 |
| | C. G. Einhaus | 2 |
| | Frank Fenner, Jr. | 1 |
| | Mrs. C. L. Fredrick | 4½ |
| | W. Howard Fredrick | 3 |
| | Frank E. Fuller | 1 |
| | Americo Grasso | 1 |
| | Fred A. Helm | 1 |
| | Lionel Heymann | 1 |
| | A. E. Hjerpe | 1 |
| | Betty Henderson Hulett | 1 |
| | H. J. Johnson | 13½* |
| | Robert M. Keith | 1 |
| | Mrs. Blanche Kolarik | 4 |
| | Monte Kople | 1 |
| | Russel Kriete | 1 |
| | Lou H. Leff | 1 |
| | Warren W. Lewis | 2 |
| | Mary Matsumara | 1 |
| | Jean Mowat | ½ |
| | Walter E. Parker | 29* |
| | Klem Petrosius | 1 |
| | D. A. Pritchard | 2 |
| | F. Purrington | 1 |
| | Lewis T. Reed | 1 |
| | James Riddick | 2 |
| | Evelyn M. Robbins | 2 |
| | J. H. Sammis | 1 |
| | Clara Schmitt | 1 |
| | Pearl E. Schwartz | 2 |
| | Frederick T. Sharp | 1 |
| | J. P. Wahlman | 1 |
| | Rennie I. Weber | 2 |
| | S. P. Wright | 2 |
| | Mabel Young | 4 |
| Iowa | Edith M. Royky | 6* |
| | Mrs. John J. Strandberg | 1 |
| | Waterloo Camera Club | 1 |
| Minnesota | Larry D. Hanson | 25* |
| | V. P. Hollis | 1 |
| | Conn H. Irber | 1 |
| | Vim Michael Judd | 1 |
| | John H. Wilke | 1 |
| Wisconsin | E. A. Byrsdorfer | 1 |
| | Alan J. Dale | 1 |
| | Dr. Milton L. Kuhs | 3 |
| | Ted Laatsch | 1 |
| | Robert J. Lauer | 5* |
| | Ray Miess | 25* |
| | V. E. Shimanski | 20* |
| *District No. 8* | | |
| Washington | A. M. Kendrick | 4 |
| | Joe Marshall | 5* |
| Oregon | Lafe L. Foster | 2 |
| | C. W. Getzendaner | 4 |
| Montana | CC of Bozeman | 2 |
| | Carlton L. Lingwall | 6* |
| | Frank R. Rademaker | 1 |
| Idaho | None | 0 |
| Wyoming | Dick Harris | 1 |
| *District No. 9* | | |
| California | Dr. Werner Alexewicz | 1 |
| | A. Appelman | 1 |
| | K. V. Arntzen | 3 |
| | Esmond Arthur | 1 |
| | J. Philip Bambara | 2 |
| | John F. Barnes | 1 |
| | Karl A. Baumgaertel | 1 |
| | E. W. Blew | 10* |
| | Harvey W. Brown | 12* |
| | Clyde L. Browning | 1 |
| | W. W. Callow | 1 |
| | Harold M. Child | 1 |
| | Moreland M. Deaderick | 7* |
| | Boris Dobro | 40* |
| | Milton Efron | 1 |
| | Merle S. Ewell | 2 |
| | Frank R. Farhone | 1 |
| | Donald B. Finch | 1 |
| | John Forsythe, Jr. | 1 |
| | Harold Girton | 3 |
| | Clifton L. Hagenbuch, Jr. | 2 |
| | Max J. Harn | 1 |
| | Vincent H. Hunter | 1 |
| | C. B. Jowett | 1 |
| | John B. Mengel | 3½ |
| | Clyde A. Prussman | 1 |
| | Frederick L. Richards | 1 |
| | A. E. Soderberg | 1 |
| | Max Sorensen | 1 |
| | So. Cal. Council of CCs | 3 |
| | So. Cal. Sec. Tech. Div. | 1 |
| | Carl Terhune | 1 |
| | Harold L. Thompson | 1 |
| | H. A. Thornhill | 4 |
| | Charles L. Wilson | 4 |
| Nevada | None | 0 |
| Utah | Dr. S. Wayne Smith | 1 |
| Colorado | Dr. Max Giesecke | 1 |
| | Roy E. Petersen | 1 |
| | Stuart Shaw | 1 |
| New Mexico | Henry C. Kyllingstad | 1 |
| Arizona | Bruce Cole | 1 |
| | Leslie J. Mahoney | 2 |
| *District No. 10* | | |
| Alaska | Gilbert G. Whitehead | 2 |
| Hawaii | Frederick F. D. Chu | 1 |
| | Gilbert H. C. Lum | 4 |
| | David A. Muramoto | 2 |
| | National Photo CC | 6* |
| | Hy Seldidge | 2 |
| | H. A. Touhy | 6* |
| Puerto Rico | William C. Ihlefeld | 1 |
| Canal Zone | None | 0 |
| *Area 1* | | |
| Canada | William B. Bate | ½ |
| | Cinq-Mars Benoit | ½ |
| | Raymond Caron | ½ |
| | Dr. M. A. Chantler | ½ |
| | Stanley C. Dakin | ½ |
| | George Fearnley | ½ |
| | J. W. Galloway | ½ |
| | George G. Hirt | ½ |
| | James A. McVie | 6* |
| | New Westminster CC | ½ |
| | Cyril F. Smith | ½ |
| | Oliver W. R. Smith | 5½* |
| | Sam J. Vogan | 8* |
| | Harry L. Waddle | 1 |
| | Walter F. Wood | 1 |

| State | Name | Points |
|---|---|---|
| *Area 2* | | |
| Brazil | Jose Rastelli | 1½ |
| Chile | Rudy Hirsch | ½ |
| Costa Rica | Dr. Esteban A. DeVarona | 9½* |
| Cuba | Angel DeMoya | 13½* |
| | F. Figueredo | 1 |
| | Jorge Figueroa | ½ |
| Mexico | Gordon C. Abbott | 1 |
| | A. W. Gelbke | 1½ |
| Venezuela | Frank J. Delima | 5½* |
| *Area 3* | | |
| England | Dr. Peter Hansell | ½ |
| | Arnold Kidson | ½ |
| *Area 4* | | |
| Australia | Max Walton | ½ |
| Hong Kong | Dr. Ernest To | 9* |
| | Francis Wu | 1½ |
| India | K. M. Banerji | 9* |
| | C. N. Chambers | ½ |
| | S. V. Gopal Row | ½ |
| | Dr. G. Thomas | 6* |
| New Zealand | F. Lennard Casbolt | ½ |
| | Harold A. Larsen | 8½* |
| | Maj. Keith R. Mosheim | ½ |
| PSA Journal | | 3 |

* Championship Medal
** Not eligible for higher awards

# OFFICIAL NOTICE

At the Annual Meeting in Baltimore, the Board of Directors voted unanimously to amend the Constitution and By-Laws with regard to PSA chapters and representation.

To comply with the By-Laws which state that the entire membership shall be told the changes, this constitutes an official notification. The proposals are:

To amend Article XII, Section 1 to read: "that there be one representative from each state and/or territory of the United States and each province of Canada plus additional representation on the basis of one additional representative for each major fraction of 200 members above a base level of 200 members."

To amend Article XIII by adding the following: "No Chapter shall have any authority to act as an agent of this Society for the purpose of incurring any financial obligation which may be binding upon this Society and each Chapter shall agree to hold the Society harmless from any and all such obligations incurred by it which might be binding upon the Society."

JOHN G. MULDER, APSA, *President*

## *Annual Membership Meeting* *

The Annual Membership Meeting was held at the Lord Baltimore Hotel, Baltimore, Maryland, on October 18, 1950 and was called to order by Treasurer Heller at 3:15 PM.

Mr. C. E. Emery read a greeting and welcome from the Mayor of Baltimore. Mr. Emery reminded the membership that the Exhibition would open at the Memorial Art Gallery on Wednesday evening, October 18. He announced that the boat trip would leave from Pier 1, Pratt Street, at 12 noon on Thursday, October 19.

Mr. Heller requested subjects to be discussed at this meeting. The following items were brought up: Cornerstone Memberships, Local Chapters, Tops.

Mr. Heller introduced Mr. Fred L. Bowron from Christ Church, New Zealand.

Walter Parker (Chicago) announced that he had obtained a Cornerstone Membership from a young man 21 years old and that Irene Reiser had also purchased one.

Norris Harkness (New York) stated that Tops could do a lot for PSA. This type of show has been put on 4 times in New York. It usually includes an invitational print show, slide show, movies, and a speaker. Such a show arouses interest in photographic organizations and aids in selling more cameras, film, paper, and equipment. Tops will get together top prints and slides. All divisions will help. The Motion Picture Division will supply top-notch movies. An auditorium must be obtained and also a speaker. A speaker can usually be obtained by paying his train fare and other expenses. The PSA Speakers' List can be used. Such a project costs little and offers great returns. Equipment could be borrowed from dealers, a hall would need to be hired, and good publicity coverage is necessary. On this basis an evening of photographic entertainment would probably cost no more than $30 or $40 plus speaker's fees. Some local group must be willing to get it started in their town. It was suggested at Hartford and in Philadelphia, but little interest has been aroused. PSA is willing to help affiliated local groups put on PSA Tops Shows in various localities. Those interested should contact PSA Headquarters, Mr. Gibbs, or Mr. Harkness.

Walter Parker stated that a $50 fund is being set aside for a period of 5 years in the Fort Dearborn Camera Club. From this fund free dues in PSA is given to a young member each year as a reward for the most progress. This will go on for 5 years.

The meeting was adjourned at 3:50 PM.

## *National Council Meeting* *

Present: *National Officers*
C. Heller
J. G. Mulder
P. H. Oelman
S. F. Wright

*Board of Directors*
G. F. Johnson
H. R. Reich
W. F. Swann
Miss Doris M. Weber

*Honorary Representative*
Angel DeMoya

*District No. 1 Representative*
Lee Ellis

*District No. 2 Representatives*
H. C. Carlton
Norman Lipton
Mrs. Helen C. Manzer
Paul J. Wolf

*District No. 3 Representatives*
A. Aubrey Bodine
Mrs. Caryl Firth
Dr. J. O. Fitzgerald

*District No. 4 Representatives*
Dr. C. J. Marinus
Mrs. Constance L. Phelps

*District No. 5 Representative*
Cortland Luce

*District No. 7 Representative*
Frank Fenner, Jr.

* Received by PSA Journal 18 January 1951.

The Annual Meeting of the National Council was held at the Lord Baltimore Hotel, Baltimore, Maryland, on October 18, 1950.

The meeting was called to order at 4 PM. with President Mulder in the chair. Secretary Wright called the roll and it was found that a quorum existed. National Council members were seated in front rows of the hall, leaving the balance for the general membership. Secretary Wright read the list of deceased persons for 1949 and 1950.

President Mulder opened the meeting by addressing the membership, appraising the state of the Society, and reporting on activities of the past year. This address is printed elsewhere in PSA JOURNAL.

The following items were discussed as included on the agenda:

*How Can PSA Membership be Made More Valuable?*

Cortland Luce (Atlanta, Georgia) suggested that correspondence courses be tried by PSA. Such courses would be especially helpful in the smaller towns. Some people are easy to sell on PSA membership because they are interested in every phase of photography. However, some ask "What do I get out of it?" Correspondence courses would be especially beneficial in getting beginners interested in PSA. The smaller communities are handicapped because there are few top-notch photographers in the smaller towns and it is difficult to bring them in for lectures.

Lee Ellis (Waban, Massachusetts) stated that the JOURNAL should be kept at a high level and then go on to expanding other phases.

Dr. A. W. Biber (Spartanburg, South Carolina) was invited to the stand and expressed himself in favor of Mr. Luce's suggestion for correspondence courses.

Upon motion by Mr. Luce, seconded by Mr. DeMoya, it was unanimously recommended that the Board consider the preparation of a correspondence course.

J. E. Armstrong (Detroit, Michigan) stated that for some time he had saved salon catalogues and then found that they could be used in the Pictorial Division Print Analysis Service to help members make better prints. When he feels a print could be improved, he clips a similarly handled subject from a salon catalogue and sends it to the maker of the print involved.

A. C. Klein (Milwaukee, Wisconsin) ventured that new members could be obtained through old members by showing the benefits and activities of the Society.

Frank Fenner, Jr. (Barrington, Illinois) pointed out that most PSA members are not super salemen. What they need is a booklet telling how to sell memberships and listing the advantages of membership. A check sheet showing benefits available should be included so that prospective members could indicate their choices.

Ralph Gray (San Antonio, Texas) was invited to discuss his Petite Salon idea. He pointed out that this program could benefit the amateurs. Prints would be limited to 4 x 5" size. First, second, and third prizes could be awarded. The winners could choose mentors (advanced workers) in the club to help make an 11 x 14" or

larger print from the winning negatives. The beginners could be invited to the mentor's darkrooms to see how such enlargements are made. In no way should the beginner's work be condemned. This would cause him to be discouraged and give up. The Society could assist the program by providing (1) recognition of mentors and (2) a competition with prizes for prints produced.

Dr. C. J. Marinus (Detroit, Michigan) pointed out that a similar idea was tried in his camera club and it went over very well.

Upon motion by Mr. Fenner, seconded by Mrs. Phelps, it was unanimously recommended that the Board consider the Petite Salon plan for use by camera clubs.

A discussion of rating camera clubs on the red, gold, silver star basis followed. Norman Lipton (New York) pointed out that such a rating is a difficult one for camera clubs.

Dr. Marinus stated that only a small percent of club members are also PSA members.

Upon motion by Mr. Fenner, seconded by Mr. Lipton, it was unanimously recommended that the Board consider the possibility of rating clubs and sections with a view to rendering additional future services to clubs and sections consisting of 100% PSA members.

Axel Bahnsen (Yellow Springs, Ohio) suggested having the portfolio group select prints and comments which have made the rounds, make up a shipping case of these prints, and use them together with the correspondence course to help beginners and members in small towns.

P. H. Oelman (Cincinnati, Ohio) stated that Earle Brown (Detroit, Michigan) is working on a Speakers' List but he has no one on the list from the East. Members should send suggestions to Mr. Brown. Mr. Oelman asked if the Speakers' List should be continued.

Dr. Marinus stated that small communities need such a list. The small clubs should be approached before we can answer this question. He asked about tape recordings.

Mr. Oelman replied that tape recordings are not meant to take the place of speakers, but to supplement this program. Speakers should go around to small towns near their homes and lecture for PSA.

David B. Eisendrath, Jr. (Brooklyn, New York) stated that before sending to Earle Brown a person's name as a speaker, members should find out the speaker's feelings about pay for lectures.

No recommendations were made to the Board.

*Honors*

C. Martz (Aurora, Missouri) wrote that he felt the PSA honors awards should be based on points for each duty done.

A. A. Bodine (Baltimore) felt that a point system would not work well for PSA. He felt that honors should not be passed out too freely because that would lower their value.

Mr. Eisendrath thought PSA should publish in the JOURNAL the requirements for each honor. Mr. Mulder pointed out that citations will be published this year for all awards. It was felt that back names should also be published. F. Quellmalz (Kutztown, Pennsylvania) stated that biographical sketches of PSA members are published from time to time as money and space permit. Mrs. Helen Manzer (New York) stated that artistic effort and creative art are difficult to measure in numerical value.

Upon motion by Mrs. Manzer, seconded by Mr. DeMoya, it was unanimously recommended that the Honors Committee continue to evaluate candidates of honors in terms of artistic effort and scientific achievement.

Mrs. Virginia Leberman (Austin, Texas) inquired about the requirements for the APSA. Chester Wheeler (Rochester, New York) answered by stating that on the back of the honors application form and also published in the JOURNAL are the qualifications for the various honors. Any member may propose himself for APSA or FPSA or another member may propose him for any of the honors. Completed application blanks should be returned to Headquarters. Headquarters forwards the applications to the Chairman of the Honors Committee. One copy of each application is sent to each member of the Committee. Each candidate is voted on by each member of the Honors Committee and a meeting is usually held to discuss the balloting and to draw up the final list of honors. As much emphasis is placed on public service to photography as on artistic ability.

There being no further business, the meeting was declared closed at 5:40 PM.

S. P. WRIGHT, *Secretary*

## *Message to the National Council*

JOHN G. MULDER, APSA, *President*

In 1948 at the first meeting of the National Council in Cincinnati, Charlie Phelps addressed the Council to discuss the status of the Society. We found that the Council was then better able to act constructively in handling the business before it. Thus it's becoming a precedent for the president to address the Council before it takes up its business at the Annual Meeting.

At the last meeting I pointed out that our aims and objectives had been geared to such a high level of photographic attainment that the Society was not interesting to new-comers who had not yet become proficient in photography. There were too few activities and benefits for the average member. Also, with the increase of dues to $10, we were obligated and able to provide more services. During the past year the Board and the Divisions have taken steps to make PSA more attractive to new members and more beneficial to all. I'd like to mention briefly some of these innovations.

*(Turn to page 151)*


# "Wollensak Lenses are tops, and allow me to satisfy the most critical magazine editors,"

**says OZZIE SWEET, one of AMERICA'S TOP COVER PHOTOGRAPHERS**

● Wollensak Raptar Lenses and Rapax Shutters are adaptable to any kind of work demanded of a photographic illustrator. As a cover photographer who must handle all types of jobs under all conditions, I have found Raptar lenses most versatile. They give sharpness, all-over definition, and depth of field—factors that are so necessary in my work. In short I'd say the resolution of Wollensak lenses is tops and satisfies the most critical magazine editors. I recommend Wollensak lenses for either color or black and white.

Ozzie Sweet


. . . another example of Wollensak leadership. Reason why leading press, portrait and salon photographers, as well as thousands of amateurs rely on Wollensak Raptar lenses and Rapax shutters to get the fine results they want and can expect. Don't accept less than the best. Be sure your camera is Wollensak equipped.

***WRITE*** for literature on Raptar Lenses and Rapax Shutters. Wollensak Optical Co., 911 Hudson Avenue, Rochester 21, N.Y.

***WHEN YOU BUY WOLLENSAK YOU BUY THE BEST***

**Wollensak** OPTICAL CO., ROCHESTER 21, N. Y.

MEANS FINE LENSES

# Animal Cracks

EUGENIA BUXTON

PHOTOGRAPHING small animals in action is for me one of the most exciting moments behind the lens. It is a sort of challenge to maneuver these unsuspecting subjects into amusing poses and situations and be ready to catch them at their peak expressions. Call it animal psychology if you wish, one must "have a way with the varmints" and infinite patience; and one must have developed an automatic shooting technique as a means of concentrating on the picture itself.

In arranging a set-up I use a kitchen table or a platform on saw horses about thirty inches high. Props are kept naturally simple to emphasize the subject material. On assignment away from the studio I carry two large wool blankets, one light green and one dark (solid colors, of course). These do not wrinkle easily and can be attached to a wall or background. I work at slightly above table height and at a distance of about six feet from the subject. When focusing it is advisable to allow extra space at the edges of the groundglass because the animals are apt to move about. They keep you hopping, so the camera must be ready to record their antics. Incidentally, a sympathetic assistant to help arrange and retrieve the subjects is of considerable advantage.

For this type of work I use a 3¼ x 4¼ Speed Graphic, with 135mm lens at f/22. A steady tripod is important for wire-sharp focus. I prefer Super Panchro Press Type B film developed in Microdol by inspection. This yields for me a negative easily printable on Opal paper in a condenser enlarger.

My lighting arrangement is as follows. One No. 4 photoflood bounced against a white ceiling gives general illumination. Two portable speedlights (Synctron) are synchronized to the shutter. The main light is placed at about a forty-five degree angle from the camera axis and high enough to put the cast shadow behind and below

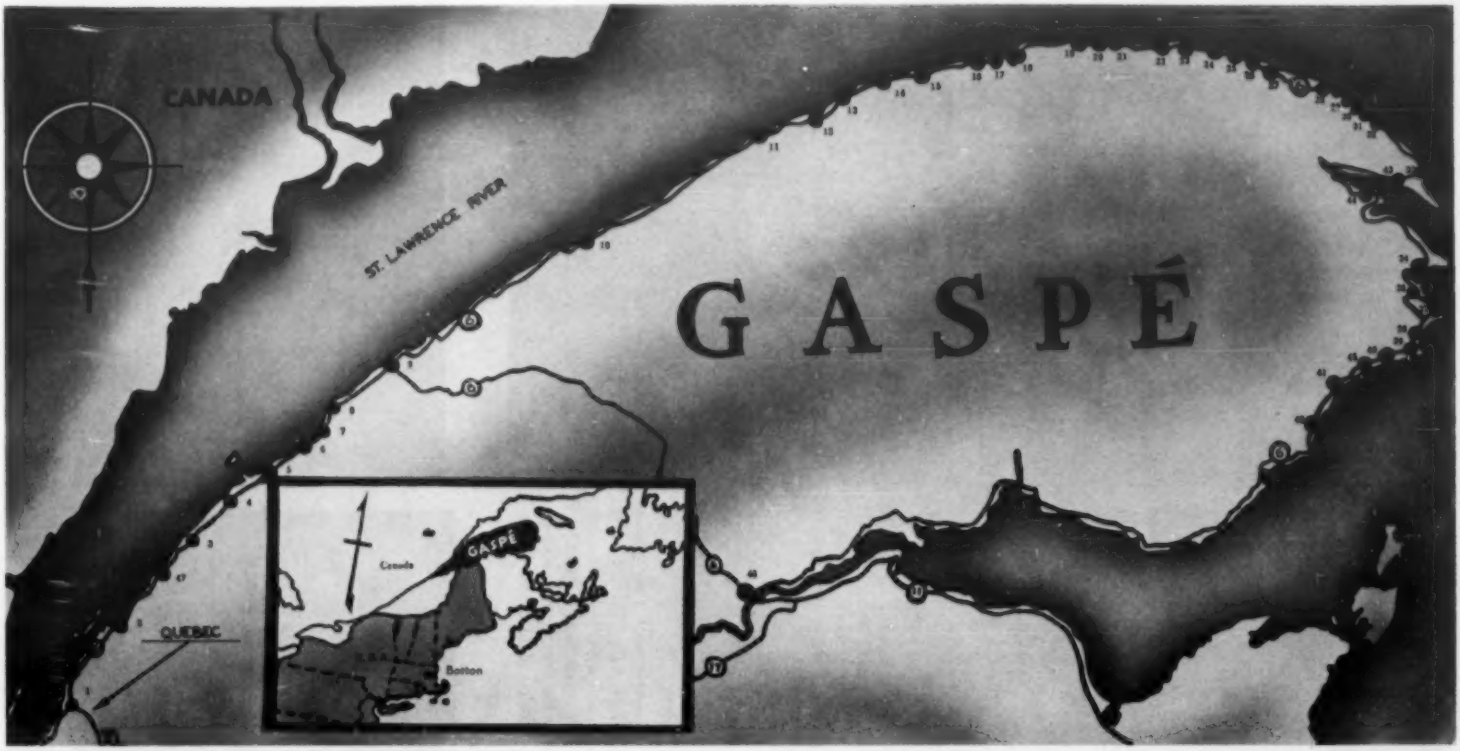
*(Turn to page 125)*

YOO, HOO! PETER! Eugenia Buxton

MIND YOUR MANNERS! Eugenia Buxton

DONALD & PETER Eugenia Buxton

SOFT, EH? Eugenia Buxton




*Key to Map*

1. Riviere du Loup
2. Isle Verte
3. St. Simon
4. St. Fabien
5. Bic
6. Ramouski
7. Luceville (St. Luce)
8. Pointe au Pere
9. Mont Joli
10. Matane
11. Cap Chat
12. Ste. Anne des Monts
13. St. Joachim de Tourelle
14. Cap du Renard
15. Riviere a la Marte
16. Riviere a Claude
17. Mont St. Pierre
18. Anse Pleureuse
19. Manche d'Epee
20. Petite Madeleine
21. Madeleine
22. Grand Vallee
23. Petite Vallee
24. Pointe a la Fregate
25. Cloridorme
26. St. Yvon
27. Grand Etang
28. Petite Anse
29. Petite Cap
30. Petite Riviere au Renard
31. Riviere au Renard
32. L'Anse a Fugere
33. Cap des Rosiers
34. Barachois
35. Pointe Jaune
36. Coin du Bane
37. Perce
38. Anse a Beaufils
39. Cape Cove
40. Ste. Theresa
41. Chandler
42. Newport
43. Cap-aux-Os
44. Gaspe
45. Grande Riviere
46. Matapedia
47. Troi Pistoles

# "How To" No. 14—TAKE A PHOTOGRAPHIC TRIP TO GASPE

JOHNNY APPLESEED, APSA

GOT A YEN to travel to faraway places? Ever wanted to take a picture-making vacation in Europe? Want the relaxation of the atmosphere of a foreign country but lack the where-with-all or time to go "faraway"? Want a camera-fan's vacation with unique possibilities for color, motion picture, or black-and-white shots of nature, documentary, and pictorial subjects? Like to get in some good trout or salmon fishing on days when light's not good for pictures?

If your answer is "Yes," then it's Canada's Gaspe Peninsula you want. If you were enthusiastic over the column last June on Maine, and your correspondence indicates you enjoyed that tour, you haven't even scratched the surface of photographic travel fun until you've made a picture record of the Gaspe.

Don't wait. Go soon. The Gaspe is changing fast and soon modern equipment and methods will replace the picturesque old ways of Gaspe life. Time was when farmers used oxen instead of horses, but those days are gone. The quaint old wooden windmills are giving way to electric and gasoline motors. Homespun fabrics are being replaced by "store clothes." And the old outdoor stone baking ovens are being supplanted by up-to-date indoor cooking ranges and some kitchens even boast "bottled gas."

Despite all this progress, it's still possible to find many Gaspesians living and working much as their ancestors did back in 1800 or earlier. Their farming, fishing, and lumbering activities under these conditions provide unbeatable picture material in all branches of interest. The Gaspe boasts some of the most picturesque and colorful scenery in the world and offers the richest possible opportunities for a series of pictures for lecture purposes or for motion pictures that document the area. It's unsurpassed for pictorial shots, too.

The Gaspe Peninsula is that part of the Province of Quebec that protrudes like a thumb into the Gulf of the St. Lawrence River northeast from Quebec City. There are three main roads by which you can reach the Gaspe: by Highway 10 from Quebec City, by Highway 2 from Bangor, and by Highway 11 from the Province of New Brunswick (also through Maine).

The area is divided into two counties, known as Gaspe Nord (north) and Gaspe Sud (south). Gaspe Nord, Cap Chat (11) * to Perce (37), lends itself far more readily to interesting pictures than Gaspe Sud, the area beyond Perce. As a matter of fact, I always confine my photographic visits to the coast between Joachim de Tourelle (13) and Grande Riviere (45) (see map) and concentrate on Gaspe Nord between Pointe a la Fregate (24) (Frigate Point) and Riviere Au Renard (31) (Fox River).

Most of the Gaspesians are descendants of early traders and fishermen who came over from France soon after Jacques Cartier discovered the land in 1534. Due to the geographic isolation of the area (Gaspe comes from Indian and means "the extremity") and because a highway around the peninsula was completed only a few years before World War II, the people have held to many of their pioneer customs.

French is spoken exclusively in Gaspe Nord and both French and English in Gaspe Sud. Don't let your inability to speak French discourage you. There's usually someone in each village who speaks English and where you don't find one, there's always the sign language. You'll find Gaspesians most hospitable and willing to cooperate.

June, July, August, and early September are the best months for pictures and for pleasant summer weather. Because of its northern location, Gaspe summers are usually cool. Fogs are not uncommon in late July and

Fishing boats by the sea at Pointe Jaune (Yellow Point). Along the north shore (Gaspe Nord) many fishermen still use hand-rowed boats.

* See map. Numbers refer to locations on map.

*The Illustrations*

Pictures for this column were made from 620 negatives exposed with a camera having a lens of normal angle of view, that is, neither wide nor narrow angle. Full negatives were printed (except for slight end cropping) to show readers the types of subjects available, and to show what an ordinary camera sees.

In most cases a normal lens is adequate on the Gaspe, but some use will be found for narrow angle. The problem is more serious with color photography than with black-and-white (b & w), since with the latter small negative sections can be enlarged. On my last jaunt to Gaspe, I used 3 cameras: 620 with normal angle lens for b & w, and for color a 35mm with normal lens and a 35mm with 90mm lens.

JOHNNY APPLESEED, APSA

early August and although not always pleasant, they really "do things" in setting up mysterious pictures. Frankly, I hope you have fog for some of your scenes.

## *Preparation for Your Trip*

Before you leave, lay in a big supply of film, much more than you imagine you can possibly use. Include orthochromatic film, like Verichrome or Plenachrome, for pictures in fog. Load up on color film, too. It's nothing at all to shoot 10 rolls of still pictures in a day, or 300 feet of motion pictures. You'll find your enthusiasm running in high gear, so be prepared. Although popular sizes of roll, sheet, pack, and motion picture films are available in Quebec City and Gaspe City, stocks are limited and prices are higher than in the U. S. Prevent heat deterioration of your film by storing it in a cool place: ***don't*** store film in the car trunk where it'll bake in the sun.

Tune up your cameras. You'll be leaving photographic civilization when you go to the Gaspe. There'll be plenty of opportunity to use a view camera on a tripod. Most pictures are along the road and so you needn't hesitate to take cumbersome equipment. If you own wide and narrow angle lenses take them with you. You'll have lots of opportunity to use a filter, particularly yellow with black-and-white films. A pale yellow color correcting filter (CC14, CC15 or equivalent) will come in handy to diminish the excessive blueness from bright midday sun and the ocean. There are opportunities to use flash, too; take your bulbs with you. If you use sheet film, a changing bag will come in handy. A pair of binoculars will add to your pleasure. Take an alarm clock. If you're an "early up" photographer, you will find a thermos bottle handy if you fill it the night before.

Stock up on cigarettes and pipe tobacco beyond your needs so you can treat your Canadian friends. Tobacco is expensive in Canada and Gaspesians like the flavor of U. S. tobacco. Packages of "roll your own" will be a real treat and are inexpensive to give in repayment for special favors. For your young friends, load up on suckers and other candies. You should plan to live with the French people on this visit, and for a special treat to your hosts take some coffee.

Trout fishing is too good to pass up, so load up your tackle. It needn't be fancy equipment: an assortment of small hooks, a few lines, a pole. You don't even need a gut leader. A pair of boots may come in handy but aren't essential.

Be sure your car is in good shape. If it burns oil, take some canned oil with you because it's more expensive there than here. Make certain your wheel jack and tire-changing equipment are in good order. You'll need road maps. Take a good flashlight with fresh batteries.

Since some of the best Gaspe pictures can be made in fog or rain, take waterproof clothing with you and a big umbrella to protect you and your camera. Take warm clothes too. A glance at the map will tell you why.

Travelers checks provide a safe, easy way to carry money. You'll find $10 checks more easily handled than larger denominations. Don't bother to exchange for Canadian currency at the border. Canadians gladly accept U. S. funds, so there's no reason why you can't carry some small bills. Gasoline is higher in Canada than here. In 1950 gas was 35 cents per 5-quart Canadian gallon in the Quebec vicinity and 40 cents at the tip of the Gaspe. Other traveling costs are quite reasonable. Average personal expenses will run from $5 to $7 per day for lodging and meals. Take extra money if you want to shop for woolens and other Canadian bargains and souvenirs. Since you'll be shopping for homemade and homeknit articles, take measurements (not sizes) of those for whom you will buy. You're allowed $200 duty free when you return to the States.

If you have a birth certificate, take it with you. If not, no trouble will be encountered if you are American-born. ***Be sure you have your auto registration.***

## *Crossing the U. S.-Canadian Border*

We'll leave it to you to choose your route and to decide whether you'll enter from the east or west. ***Fill up with gas before crossing the border.*** Check your supply of film, tobacco and candy and replenish if necessary. Be

One of the hidden, unnamed fishing villages along the north shore of the Gaspe Peninsula.

courteous to officials for both countries. *As you leave the U. S. get a memorandum from the customs authorities for any foreign-made cameras or binoculars* to make re-entry with them simple.

At the Canadian customs be prepared to prove your citizenship. Obtain a travel permit. Be ready to tell them where and approximately when you plan to return to the U. S. You'll be required to register all valuable cameras and binoculars. Have all your luggage in condition for customs inspection.

You're now in Canada. Obey the traffic laws more religiously than in your own country. *Ask for a receipt for each item you buy to bring home.* This will speed up your clearance through U. S. customs on your return.

*Pictures!* For convenience, let's start our Canadian adventure at Montreal. This city offers little photographically, but if you're interested in old French architecture, including old windmills, take Highway No. 3 toward Levis along the south shore of the St. Lawrence to Vercheres where you'll find an old mill north of the village between the road and the river. Cross the river at Sorel to enjoy the better north shore road and to photograph the delightful old French architecture in the Berthierville-Three Rivers-Quebec area. The highway is lined with authentic buildings 150–200 years old. The French use paint lavishly and frequently decorate their houses with 4 to 5 different gay colors. Barns are usually white. These buildings make colorful subjects for pictures in color.

*Quebec City* has enough photogenic spots to warrant its own column. Spend a day or two there if you can. Plan to arrive by 3 to 4 PM in order to reserve a room before they're all taken. There are comfortable tourist homes on streets behind the Chateau Frontenac. Excellent meals at reasonable rates can be obtained in Quebec at the Old Homestead and at other restaurants nearby. Here are a few places to photograph. Take the elevator from the boardwalk to the old city and walk to Su le Cap, a narrow street immediately beneath the cliff; explore the winding streets in the old city near Hotel Louis XIV; try a pattern shot of roof tops in the old city from the boardwalk at Chateau Frontenac, looking down, with early morning light; take a shot of the Chateau from the mount in early morning light, with special cloud effects, or in the early evening as the first lights come on.

By all means visit Isle d'Orleans (Island of Orleans), a half-hour drive from the center of Quebec. There you'll find quaint French farms, dog-drawn carts, people working in fields with French colonial homes and Laurentian mountains in the background. It's a great place for color. If you're pressed for time, turn left after crossing the bridge to the island and drive to Ste. Famille (Holy Family) and return. The rest of the island is much less interesting. Mme. Plante, who lives across the street from St. Pierre (St. Peter) Church, usually has beautiful handwork at reasonable prices. She speaks English.

Returning to Quebec, load up on gas (it becomes more expensive as you progress) and cross the St. Lawrence by ferry to Levis. Follow Highway No. 2 (don't take 2A) to Riviere du Loup. The area from Ste. Anne de la Pocatiere to Riviere du Loup (1 on the map) is most

Dogs work hard on the Gaspe, pulling carts bearing all sorts of loads. This picture was made at Pointe Jaune (Yellow Point), one of the most photogenic spots on the Gaspe Peninsula.

interesting and colorful, and there's an old creamery on the right in St. Denis de la Bouteillerie of which someone's going to make a good shot (I didn't). *Caution*: Gaspesians walk in the road; drive carefully.

Beyond Riviere du Loup there may be occasional photogenic subjects, but don't plan on much until you reach Isle Verte (2).

Near Isle Verte, watch on the left for Mme. Willie Talbot's conspicuous sign advertising handmade articles. Be sure to stop! Here is an opportunity to photograph Mme. Talbot at her work of spinning wool from her husband's sheep, weaving cloth on a loom, etc. You can buy homemade Gaspe bread from her outdoor oven. If you buy woolen socks, be sure they're large enough. Gaspe women are accustomed to fitting Frenchmen who have small feet. Mrs. Talbot is a remarkable woman: she has mothered 19 children of whom 14 are living. Big families are the rule on the Gaspe. Behind the barn is an archaic wooden windmill that operates only when the wind blows from the northwest. It's 135 years old.

The lumbering country around Trois Pistoles (47) (Three Pistols), Bic (5), Rimonski (6) (where the big fire occurred during the 1949–50 winter), Pointe au Pere (8) (Father Point), and Mont Joli (9) has less photographic possibility than cities farther along. Any of these towns has good hotel accommodations.

Your collection of Gaspe pictures won't be complete without the roadside shrines and the two-language road signs.

Photographic interest remains fairly low until you reach

Cod fisherman returning from his morning catch. Usually fishermen are off to sea at dawn. They return as soon as a suitable catch has been made. In the evening they go to catch herring for the next day's bait.

Cap Chat (11) (Cape Cat), but keep your eyes open and your equipment ready. There may be a shot at any time among these quaint settings. If you reach the Cap Chat area near evening, better put up for the night, rather than drive the winding roads beyond Ste. Anne des Monts (12) after dark.

*Cap Chat (11) to Pointe a la Fregate (24).* You're in for a change of scenery and winding roads through mountains, by the edge of the sea, and beneath steep, black cliffs that rise sharply from the shore. Sometimes the road creeps to the tops of hills from which you'll have thrilling scenic views that'll provide panoramas worthy of many shots. Don't neglect to look back. Frequently, you can make an interesting shot looking down on a fishing hamlet such as Riviere a la Marte (15), nestled beneath tall hills by the sea. The scenery is particularly beautiful near Anse Pleureuse (18) (Weeping Cove), and Petite Madeleine (20).

*Warning: Don't drive your car off the main road onto side roads.* Lanes and side roads may have rusty nails which can ruin your tires. This is particularly true along the gravel roads beyond Joachim de Tourelle (13). Watch out for rocks which may have fallen from the cliffs into the road. Keep to the right.

Sunlight intensities are higher than normal by the ocean and film exposure will often be about ½ to 1 stop less than usual. Since exposure of color film is quite critical, be sure to appraise your camera settings carefully for all shots beginning at Cap Chat. As an example, the basic exposure for Kodachrome in bright sunlight by the sea will be about 1/50 second at f/8, rather than the usual 1/50 at f/6.3. Make corresponding adjustments in black-and-white exposures unless you plan to overexpose and underdevelop to diminish contrast (see the December 1950 column). It's good practice where many rolls are exposed under varying lighting conditions to note on the exposed roll the degree of development best suited for the roll.

If you're a fisherman, don't overlook the little streams that empty into the sea along the route all the way to Riviere au Renard. Your fishing license can be purchased in most stores at a very nominal price.

The lighthouse at Petite Madeleine (20) is worth a shot or two in black-and-white and in color. Include the winding road with and without someone walking on it. There's a chance here to use your narrow angle lens.

One of the joys of a trip to Gaspe is the scenic surprises and most of all the hidden villages. There's one that I alternately found and lost several times before marking it on the map. Watch carefully for it 0.5 mile beyond Petite Madeleine (20) on the left. See if you can make a good picture from the main highway, using the curved village road for a leading line. If you can include a pedestrian near the bend in the road you should have a pleasing shot. Walk down into the village. Remember the car rule: leave it on the highway.

Beginning with this little unnamed village, in fact starting at Joachim de Tourelle (13) or Riviere a la Marte (15), your motto should be: *"There's a picture in every village and I'm going to get it."* Really, there's usually more than one. *You should stop at every hamlet from here to Riviere au Renard (31), get out of your car and explore for pictures. Talk with the people,* live with them, and you'll be gratified to see the pictures unfold. Occasionally, photographers return from Gaspe without pictures; invariably they hurried and failed to take time to explore the villages and know the people.

At various places along the road you'll find handcraft for sale. In some areas (mostly in the early part of the trip) it's needlework, while in other parts are hand-carved wooden objects. These make excellent souvenirs and their makers yield interesting pictures. Where a particular art flourishes, you should stop, because further opportunity may not come.

Near Madeleine (21) keep an eagle eye on the ocean side for another of those old wooden windmills about 100 yards off the road. You'll want at least a record shot.

Take your time. Be particularly cautious if you drive

Crude wooden mill, near Cloridorme, used for sawing lumber. The wheel cannot be moved to face into the wind and can operate only when wind blows on its front.

on Sunday because Gaspesians stream to church on foot, walking in the road. This can be to your advantage because an interesting picture can be made of the Sunday church procession at Grande Vallee (22) by shooting down from a high point on one of the side lanes west of the village, using the road as a leading line in your composition.

*Pointe a la Fregate* (24) (Frigate Point) has innumerable opportunities for pictures of cod fishing activities. The boats are over the bank, out of sight from the road. Don't pass up a Gaspe Nord village because you can't see boats. Every village has them. There's a good hotel here (Etoile du Nord or North Star). The French hostess, Mrs. Francoeur, has spotless rooms and cooks delicious cod fish caught by her husband. Here and elsewhere be sure to eat fresh Gaspe salmon, broiled or boiled (delicious) or broiled fresh cod. Mrs. Francoeur doesn't speak English, but the sign language works. Or you can show her this sentence to tell her you desire a room: Avez vous chambre pour un (deux, trois, quatre, cinq)? Translated this is "Have you room for one (two, three, four, five)?" For breakfast or lunch show her this sentence: Avez vous dejuner? For dinner: Avez vous diner? To inquire the price: Combien? (Fun, isn't it?)

*Cloridorme* (25) and the villages to Petit Cap (29) have long lanes, lined with rail fences, frequently leading to characteristic old Gaspesian buildings. What a setup to yield strong compositions! By all means, concentrate on these towns.

In the Cloridorme (25)—St. Yvon (26) area children sell hand-carved boat models at reasonable prices along the road.

You'll find that the sun comes up at about 2:30 AM in July and August on the Gaspe. It's so bright that last June at 5:30 AM I shot Kodachrome at 1/50 second and f/5.6. Since the best light for outdoor photography often comes in the early morning (and late afternoon) and because the Gaspe has picturesque activities at 5 to 6 AM, you'll find it your double advantage to start your picture-taking early. In the early morning Gaspe women walk

Fishermen fogged in along north shore. Fogs are fairly frequent in late July and early August. They provide excellent picture opportunities by obliterating unwanted details.

Fisherman's cottage at Pointe Jaune (Yellow Point). Pointe Jaune and other villages in the area have long rail fences which assist greatly in composing pictures.

along the lanes carrying pails as they bring in water and go to milk the family cow for breakfast milk, and fishermen go to sea for cod. In the evening they catch herring for the next day's bait; you may find use for your flash outfit to picture their embarking and landing in the evening.

A thermos of hot coffee or tea purchased the night before and cookies will tide you across the early morning and permit you to eat breakfast after the light becomes less photogenic.

*Watch out for salt spray from the ocean on your equipment.* This caution applies particularly when a strong wind blows off the sea.

*Petite Anse* (28) (Little Cove). Before you reach Petite Anse, there's another surprise village at the end of a winding hillside road that doubles back sharply from the highway. This is a wonderful setting for a picture, particularly in color, with someone on the road and showing the colored roof tops in the background. There's a picture in Petite Anse, if the light is right (early morning preferably) looking west from the rock on the east edge of the town.

*Grand Etang* (27) (Big Pond) isn't as photogenic as its neighbors, but try a picture through the trees at the edge of the road.

*Pointe Jaune (35)* (Yellow Point) is my favorite spot of all Gaspesia. Next to Peggy's Cove, Nova Scotia, this village seems to me the most photogenic in eastern Canada. Give it a good workout.

Pointe Jaune was so named because it looks yellow from the sea. The yellow results from fields of blossoming wild mustard, typical of those found all over Gaspe from late June to September. Brilliant color contrasts can be composed on color film using these fields.

Roland Joncas, who lives in the house at the head of the long lane, can guide you, as he did me, to fish for trout in a nearby mountain lake. Roland, two of his friends and I caught 68 speckled trout in 4 hours there one day. He speaks English.

Evening at Perce, looking toward Three Sisters.

The long lane behind the Joncas' home leads to an old, weatherbeaten fisher's cottage by the sea. It's a natural setting for a picture using the lane as a leading line to the building. Try a shot from the fish house half way down the lane. Explore the waterfront.

The elder Mr. Joncas builds cedar fishing boats in his spare time. You may wish to make flash pictures of him in his workshop on the lane.

Hope for a variety of lighting conditions, including fog. There are two kinds of fog: wet and dry. Wet fog is really misty rain and with it illumination is low, requiring more than normal exposure (probably 1/50 second at f/3.5 to f/4.5 with black-and-white) and overdevelopment by 50–75%. Dry fog is brilliant, requiring the same exposure as sunlight and normal development. You can identify the type of fog by the effect on your eyes: you'll usually squint in a daytime dry fog.

*Petit Cap* (29) (Little Cape) has good picture potential.

*Petite Riviere au Renard* (30) (Little Fox River). The curved wharf provides a beautiful setting for pattern pictures involving piling and boats. Lighting is critical because early morning and late afternoon shadows play an important part in shifting emphasis. At high tide you may get a good reflection shot of a boat and the fish house east of the bridge. Try some evening reflections here, too. Make action pictures as the fishermen return.

*Riviere au Renard* (31) (Fox River) has fishing activity but the arrangement of objects isn't suitable for good pictures. You'll like Caribou Inn.

*Cap des Rosiers (33) and Cap des Rosiers Est* (Cape of Roses and Cape of Roses East). *Don't take Highway 6A*, the shortcut to Gaspe. Go through Cap des Rosiers. This point is off the beaten path and its people are interesting. Try a shot of the lighthouse at Cap des Rosiers from the beach in afternoon light. There's a snug little harbor near Cap des Rosiers Est. You may wish to stop and chat with Xavier Mercier in Cap des Rosiers Est. He can tell you where to go for a beautiful view. If you're fortunate, the Merciers may let you stay overnight.

Leaving Cap des Rosiers Est, go over the mountain to Gaspe Bay. Turn *left* rather than right at the foot of the hill and go to the end of Cap-aux-Os (43) (Cape of the Bone) for delightful scenery. Retrace your steps and proceed around the bay to Gaspe City.

*Gaspe City* (44) has good hotels and a modern drug store (Rexall) with roll film including 35mm and Bantam, film packs, and 16mm and 8mm motion picture film. They stock color film. There's not much of picture value around Gaspe. The city has historical importance, since it is here that Jacques Cartier first landed in North America.

*Gaspe to Perce*—Picture interest picks up again at Barachois (34) and Coin du Banc (36). You will note that larger boats are in use here than in Gaspe Nord. That's true for all Gaspe Sud where fishermen must go farther to sea to find cod. These larger boats lend themselves well to reflection pictures in the evening.

All Gaspesian boats are in harbor or pulled up on the beach each Saturday night and all day Sunday while their devout owners rest on the Sabbath.

Coin du Banc has interesting possibilities but offers the problem of an evergreen background. Try some shots anyway.

There are three ways to reach Perce from Coin du Banc: one a back road through Val d'Espoir (Valley of Hope), another over the mountain, and third by a new road past Peak O'Dawn. The latter is shortest and the most glamorously scenic. Some gorgeous color pictures of Perce Rock (Pierced Rock) have been made from Peak O'Dawn, high on the hill overlooking Perce.

*Perce* (37) is the scenic climax of your trip. Hope for variations in lighting during your stay because the atmosphere is frequently very moody and with each change a new picture results. If you haven't used your alarm clock on the trip, be sure to do so here; get up at day break (2 to 2:30 AM) and shoot the rock in color at sunrise from Peak O'Dawn.

There are several good hotels in Perce, but all are more expensive than usual on the Gaspe. Possibly you'll prefer to live more economically, as I do, at Vagues Vertes (Green Waves) Hotel about 4 miles south of Perce on the left, near Anse a Beaufils (38) (Bay of the Son-in-law).

Perce (37) has a real treat for nature photographers in Bonaventure Island, the large island beyond Perce Rock. This island is a sanctuary for thousands of Gannets, America's largest water bird. Of the several guides who take parties around the island by boat, Mr. Duval is the most cooperative for photographers. Also, since the island belongs to him (his grandfather earned it by driving pirates out of St. Lawrence Gulf), he will put you ashore if you wish to make nature studies of the birds. He will pick you up on a subsequent trip. If you walk across the island, take some food with you. The Gannets will permit you to approach within 4 to 5 feet for pictures without leaving their nests; in late July and early August you can photograph eggs, young birds and adults. The major photographic problem is to eliminate blurred and out-of-focus birds that inevitably are in the background. Make a few shots around Duval's barn and his landing while you wait for him to return. Maybe you can compose a color shot with mustard in the foreground and blue sea and Perce beyond.

*Perce to Grand Riviere (45).* Anse a Beaufils is a busy

little harbor with innumerable picture possibilities. Try one off the bridge, looking down on the boats that always dock there, and if you have a narrow angle lens, try some evening reflection shots in color from across the harbor.

*Cape Cove (39) and Ste. Theresa (40)* have excellent picture possibilities. Explore both.

*Grande Riviere (45)* (Grand River) is the biggest and most thriving fishing port on the Gaspe. Picture possibilities are good and worth concerted effort. This is a good place for evening reflection pictures, as well as for action.

*Grande Riviere to Matepedia (46) and Mont Joli (9).* You're a long way from home, wherever it may be, when you're in Grande Riviere. You can be thankful for the invention of the wheel. To continue the loop via Route 6 through Chandler (41), Newport (42), New Carlisle, and Matapedia (46) and up to Mont Joli (9) is the usual procedure, yet I have found picture posibilities beyond Grande Riviere so uninteresting that I regret the one complete trip I've made. Every other time I've turned back and retraced my steps to get one last chance to see and photograph Gaspe Nord. If you're primarily after pictures I suggest you do the same. If you're in a hurry or want flatter roads the rest of the way, go on around. There are excellent salmon rivers along Chaleurs Bay but most streams are leased and fishing in them is restricted.

If you're half as enthusiastic about the Gaspe as I am, you'll have shot a pile of film. Be careful to process it correctly.

*Leaving Canada, Re-entering U. S.*—As you leave Canada, surrender the travel permit. At the U. S. Customs declare all your purchases. Here's where your receipts will come in handy. Be prepared for inspection of your luggage.

If you take this trip and pick up any worthwhile tips, why not tell me in a note addressed to PSA Headquarters, 2005 Walnut Street, Philadelphia 3, Pennsylvania? Best comments will be printed in PSA JOURNAL as space permits. Want more picture travel articles? See you soon on sand dune photography.

Next Month: How To Make Pictures of Flowers.

Honare Mercier and his dog at Grande Riviere (Grand River).

## *Letters to Johnny Appleseed*

East Orange, New Jersey

DEAR MR. APPLESEED:

With many thanks for your past assistance I wonder if you will help me decide on a suitable electronic flash outfit? There are so MANY such outfits on the market that it is more than a little difficult to make a decision unaided.

Briefly, what I would like to purchase is a portable battery-operated, electronic flash outfit that would have about the same light output as a Wabash Press 25 bulb. Whether the batteries are rechargeable or replaceable is immaterial, but I have a "leaning" toward the replaceable type. The outfit will be used with both the 3¼x4¼ Super-D camera and the Kalart No. 1 camera. Withal, this outfit should be as light in weight as practicable. The initial cost of such an outfit is secondary.

G. N. GARRISON

DEAR MR. GARRISON:

I hesitate to recommend any particular piece of equipment to you. Instead, you should discuss this matter very carefully with your dealer who should be able to advise you on the matter. This has the added advantage that he will become interested in your problem, and in the event that the equipment does not measure up to his claims, you will have a chance to discuss the matter with him further and possibly get adjustments.

JOHNNY APPLESEED, APSA

* * * * *

DEAR JOHNNY:

The following comments are additions to your column on the Control of Negative Contrast in the December JOURNAL.

The usual recommended development times for black-and-white roll films as printed by the manufacturer give a development contrast suitable for making contact prints. This contrast is slightly higher than the ideal for most enlargers, particularly those using condenser systems. Where condenser enlargers are to be used it is a good idea to pick a development time that will give about 0.7 gamma as shown by the time-gamma development curves.

Development recommendations for portrait films are usually aimed at 0.70 development gamma, which is about right for most enlargers as far as the contrast from development is concerned.

In both cases it may be necesary to alter the development, as you mention in your column, in order to compensate for variations from normal lighting contrast.

JOHN G. MULDER, APSA

## ANIMAL CRACKS (From page 117)

the subject. The second light is on the camera and is diffused with two thicknesses of cheesecloth. This simple arrangement takes care of almost any position the animals may assume. Former problems of depth of field, image blur and changing of flash bulbs now are overcome, thanks to the speedlight. The photographer has but to concentrate on composition and expression and patiently await developments.

In the event you noticed a gleam in the big rabbit's eye in the illustration, the real reason was a carrot the photographer crunched to attract attention.

# West to Hold PSA Regional Convention

THE FIRST Western States PSA Regional Convention will be held in picturesque and colorful Santa Barbara, California on Friday, Saturday and Sunday, June 8, 9 and 10. The western PSA members are numerous and active in their various divisions, but never before have they had such an opportunity to get together like their eastern brothers do. Only a meager trickle ever get to the east or midwest to National or Regional Conventions. So the only answer is the west's own regional get together in a three day parade of features from east and west.

The convention is promised the personal attendance of notables from the east such as P. H. Oelman ("Photography of the Nude"), Howard Colton of Kodak ("Ektacolor and Its Uses") and others. Familiar names and faces — print and slide makers by the hundred — new contacts, new ideas, old friends — discussions, clinics, movies, print exhibits. Additional planned features will include lectures and demonstrations by Fred Archer, Fred Bond, Michael Rowl and other qualified speakers; a Photochromers' Court; judging of the Class A division of the National Club Slide Competition; showing of the accepted slides of the El Camino Real International Color Slide Exhibition; George Allen Young of San Francisco conducting a "Slide Clinic"; pictorial print, slide and film exhibits by outstanding makers in all divisions.

This regional convention is being made possible through the efforts of the Southern California Council of Camera Clubs. Its President, Rahmel Nelson, its Board of Directors and 50 member clubs are all working wholeheartedly to make this convention a huge success. Active PSA members from all western states are being drawn into the various committees as rapidly as possible. Names of a few chairmen are available now:

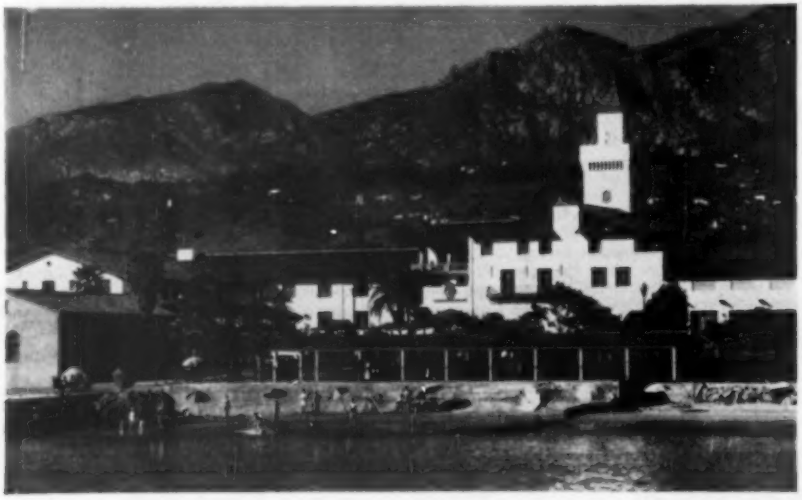
| | |
|---|---|
| General Convention Chairman | Elbridge Newhall |
| Convention Secretary | Elizabeth McMenemy |
| Program Chairman | Ernest Brooks |
| Convention Treasurer | Shumway Suffel |
| Color Division Chairman | Merle S. Ewell |
| Technical Division Chairman | Karl Freund |
| Publicity Chairman | W. F. Kelley |

The Convention Headquarters will be the Mar Monte Hotel, located on the shore of Santa Barbara Bay only a few minutes from downtown Santa Barbara. The Convention Hall is just across the way. Guest rooms are large, well furnished and quiet; some have private balconies overlooking the Pacific or the Santa Ynez Mountains which fringe the bay. While all resort facilities are available such as swimming (dress in your room and bathe in front of the hotel), boating, deep-sea fishing, golf and other sports, the special convention rates are surprisingly moderate. Additional hotel and motel accomodations are available nearby.

Coming at vacation time it is suggested that you arrange your holiday time to include the Convention. The Spanish architecture, old missions, palm trees and mountains offer settings for many pictures. Field trips to points of local photographic interest will be part of the program.

If you are planning to attend you should at once send in your registration fee of $3.00. This fee entitles you to your identification badge and will admit you to all lectures, demonstrations and exhibits without additional charge. This registration fee should be sent to: Shumway Suffel, Convention Treasurer, 338 East Green St., Pasadena, Calif. Early registration will greatly assist in developing convention plans. It will also help in planning hotel or motel accommodations for you.

WINTON F. KELLEY



MAR MONTE HOTEL
Headquarters:
WESTERN STATES PSA REGIONAL CONVENTION
JUNE 8–9–10
SANTA BARBARA CALIFORNIA

# Gray Scale and Tone Control—Part IV*

David Darvas, APSA

## THE GRAY SCALE THEORY IN APPLICATION

This part of the article is intended to illustrate, with a simple negative made especially for this purpose, how the control of its specific densities by a single process can elevate a common type of negative into a quality printer.

At the same time a short resume of the principles of dye retouching is given, preparatory to a practice exercise designed as basic training for a good consistent dye retouching technique.

If you can complete the test exercise, which follows the short resume on dye retouching, and produce a relatively clean and uniform gray scale with the dye, you are ready to control your negatives for equally successful results. However, if your test results are sloppy, it indicates that similar effects will occur on negatives during your attempts to control them.

This exercise is an I.Q. of your natural ability to retouch with dyes. Practice it! The results need not be absolutely perfect, but they should show a certain degree of consistency. The more you practice the better the results will be.

Dye retouching instruction and information is available in numerous articles, but the basic tests by which the operator can evaluate his ability have been overlooked.

The principles of retouching in the example illustration to follow are based upon the harmony and relationships between subject matter areas as explained in previous parts of this article.

Coupling the theory of area harmony with the technique of dye retouching through these exercises should open new vistas of understanding for anyone who wishes to learn the basic lessons of controlling negative and prints.

The exercise is fundamental! If you fail in this exercise, you will also fail in applying dye control to your negatives whenever such control is advisable. However, if you practice, you won't fail!

When you are finally satisfied with your practice results, mail the first and last attempts to me for analysis. (Address David Darvas, APSA, 11907 Marne Ave., Cleveland 11, Ohio.) Be sure to enclose sufficient postage and a self-addressed envelope to cover the return of your examples and the written analysis. Any extra postage above that required for mailing will be returned.

### *Dye Retouching*

The principle of dye retouching is based upon the dyeing of gelatine with certain organic dyes which will absorb actinic light. New coccine dye is one of the best, since it is easily absorbed by the gelatine of the negative and a smooth application can be made if the technique is practiced systematically. Various other dyes can be substituted but new coccine gives very consistent results with the ability to produce a wide range of tonal modification.

Film usually consists of an acetate type clear base upon which there are two coatings of gelatine. The coating on one side is clear. This is the back, or the shiny side of the negative. The other side has suspended within the coating the sensitive silver halides which respond to light and processing and will form the final negative image.

Dye retouching can be done on either side of the film, but for safety's sake, most of the work is placed on the back. With a little experience, both sides of the negative can be used, thus increasing the amount of dye control possible. New coccine dye is usually supplied in powdered form. For initial practice, mix the powder with water for a strong stock solution from which working solutions are made.

#### *Stock Solution*

Mix 15 grains of dye with one ounce of water and label it "stock." An accurate measure is not necessary. Standardize your own "stock" solution. If you have no scales for weighing, two level teaspoons will approximate 15 grains of dye which will suffice, but be sure you note exactly how much you used so that you can make future stock solutions of the same strength.

#### *Working Solution*

These working solutions are given as a "standard" for the following exercise but need not be adhered to if the photographer wishes to work with stronger solutions.

With an eye dropper, count out 50 drops of stock solution into a small bottle and add water to make one ounce. Label it "A." Count 100 drops of stock into another bottle, add the water, and label it "B."

Have the following tools handy:

1. An ample supply of clean water, about 8 ounces.
2. A small container for water, about a 2 oz. jar.
3. A bottle of wetting agent.
4. A good water color or spotting brush.
5. Absorbent cotton.
6. Round tooth picks, around the points of which cotton is wrapped, like the familiar "Q-tips" sold in drug stores.
7. A medium cotton pad about two inches long and one inch in diameter. This is moistened with water and used as a "blender."
8. A sheet of white paper stock or blotting paper, used for removing excess of dye from the brush as well as drawing the brush point into shape.
9. A small bottle of household ammonia water, which can be used as is or diluted, for removing a certain percentage of dye from the negative.

#### *Working Procedure*

The negative is taped to a sturdy retouching stand or conveniently illuminated source, strong enough to support

* *Concluded from page 71, February 1951 PSA Journal.*

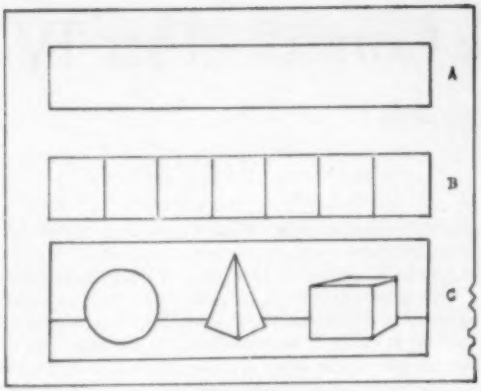



FIGURE 28

the weight of the hands during the retouching process. The negative is taped in order to free both hands for critical control of the retouching.

The cotton "blender" or pad is moistened and held in one hand. The other hand controls the brush or the cotton toothpick. Mix a few drops of wetting agent with water in the small container.

The brush and "Q-tip" applicators are dipped into this water for rinsing or thinning out the dye.

Do not add wetting agent directly to the dye. Too much wetting agent might make the dye creep and crawl beyond the outlines of the negative images.

Broad areas in the negative are controlled by various sizes of cotton applicators, which can be rolled on toothpicks as needed. Small areas are retouched with the brush. Do not use too much dye in either the brush, or "Q-tip" applicator; they must be used in a "dry" state, not sopping wet! Remove excess dye by drawing the tip across the surface of the white paper or blotting paper, while shaping the brush point.

For retouching soft edges and outlines, use the "Q-tips."

For retouching hard edges and outlines, use the brush or "Q-tips."

Immediately upon removing the dye applicator from the surface of the negative, swab or gently wipe the dyed area in one stroke with the cotton pad. This will prevent excess dye from being absorbed into portions where it isn't wanted. The cotton pad also helps to avoid streaks and pools of dye, and aids in moistening the film surface to enable smoother application of dye.

Remember to work both hands alternately. Do not allow the dye to remain too long upon any area. The dye is absorbed almost immediately upon contact. Apply the dye and wipe it off with almost the same motion. Follow through with the wiping immediately. With a little practice you will soon learn how long to "apply" and how quickly to "pad."

Do not get the gelatine surface too wet. The water will "pool" and swell the film above normal and too much dye may be absorbed and settle as round deposits and rings.

Apply the dye with one motion and wipe with one motion. Do not "punch" and "peck" with the applicators. Apply dye in contact with the gelatine surface in a steady motion. Keep a uniform pressure of the applicators on the negative surface.

As soon as any applicator is lifted from the surface of the negative, wipe the area immediately with the "blender."

If too much dye is applied at any one spot, a certain amount can be removed. Use a "Q-tip" moistened with ammonia water for this purpose. Ammonia will also aid in the blending and softening the dye deposits, thereby eliminating hard edges.

*Caution:* Above all, do not work on a retouching stand that heats up quickly from the light source. Heat will cause reticulation of the gelatine while moist. Also be sure your hands are clean and free from grease during the operation. Grease deposited on the negative causes streaks.

Begin operations with the weaker "A" working solution and use the stronger "B" solution as confidence is gained during practice. Working solutions can be made stronger as you get better acquainted with the technique.

## *Basic Practice*

On a sheet of cleared negative, rule the following designs as illustrated in Figure 28. A sheet of unexposed film, which has been fixed and washed, is best for the purpose. The design is scratched on the emulsion side with a sharp point, such as a needle. Use a ruler for all straight lines. A penny or a dime will serve as guide for the circle. In practice the dye exercise is done on the reverse side from the scratched design. The scratched outlines serve as a guide when seen through the film. Work with care and stay within the guides.

### *Procedure*

Within area "A" apply a weak dye deposit at one end, blending into stronger deposits along the entire length, until the portion of the panel at the opposite end has the strongest dye deposit possible. This exercise should be done smoothly for a continuous tone gray scale effect.

Within area "B" apply the weakest density of dye in the first square. Increase the dye in the second square, and keep increasing each square density from the preceding square for a seven step contrast gray scale.

Within area "C" shade the geometric designs so that they appear three-dimensional, so they look like a ball, pyramid and a cube. Shade in the foreground and background to complete the picture.

Make a contact or a projection print of the film and study the results. Compare the print images to the dye images to aquaint yourself with relationships of color densities to neutral densities. Remember that you are actually making a "negative." The heavier the dye the lighter it will print.

## *Now Let's Make a Quality Print!*

Let's put the gray scale to work with a simple subject photographed in simple composition. We shall try to illustrate how the reader can apply the same kind of reasoning to his own negatives for control printing.

The subject is a discarded fish bowl used as a container for a bunch of dried out paint brushes. Placed on a narrow ledge along the basement wall, it becomes a common symbol of neglect. Composed with another paint can and illuminated with one spotlight, the outline fringe of lighting forms a design associated with a painter's palette.

The color of the red brick wall in subdued illumination photographed as a thin density area on the negative. The main subject area being many times brighter is stabilized in the negative in great contrast as compared with the surrounding area.

The illustration of the negative, Figure 29, reveals a definite contrast difference between two principal density areas. Comparing those areas to key values of the gray scale, the illuminated area is similar to value No. 2 of the scale. The surrounding area compares with value No. 7. There is an apparent contrast difference of 5 steps between the two principal densities.

In simple terms of analysis this means that if a certain unit of printing time is necessary to show good detail rendition on paper in the dark wall area from the negative, it will require 10 times more printing time to penetrate the density of the main subject to show relative detail in the same print. (The actual factor depends on the number of steps on the gray scale you employ. This factor is figured from the 7 step scale described in Part I.) This relationship of contrast is too great and must be avoided or controlled for quality printing.

We have already discussed the fact that when two or more key densities are in opposition to each other, they can not possibly print in harmony at a given printing time because each has its own " key position " in the scale as compared with the other.

In this case the thin area will print in " low key " while the dense area in " high key."

As a general rule, knowing that the middle value densities will always print within the middle gray regions of the scale, our objective is to lower the " high key " densities and raise the " low key " densities closer to the middle densities of the negative.

Expressed in another way, the thin density of this example is the " toe-exposure-density," the heavy density is the " shoulder " region of the exposure. Negatives that contain large key areas of subject matter in widely separated regions of exposure can not print with unity.

The aim of quality printing has as its goal the purpose of adjusting or decreasing the contrasts between the areas of negative densities so that they are closer together. With our basis of analysis the desired portion of the exposure range is within the middle of the gray scale region. Such negatives will print with a " unity " of printing time because all contrasts are " related " with each other in the same key category.

FIGURE 29. ORIGINAL NEGATIVE

The contrast of this negative typifies a common characteristic where a thin area (toe-exposure-region) is combined as an image with a dense area (shoulder-exposure-region). Individually, both areas can produce a quality print effect, if each is given a unit of printing time appropriate for its own density, the thin area being given less printing in order to place the tone values in the straight line portion of the printing paper, while the dense area is given more printing to effect an identical result.

As we analyze our example negative, Figure 29, we note that the middle densities are rather scattered, occupying only very small portions of the negative area. The main portions are either too thin or too heavy.

Since our desired exposure range is in the middle regions of the root gray scale, the analysis follows in this manner: If the thin density could be made heavy enough so it would have a printing value of the No. 3 tone of the scale and the heavy densities lightened to compare with the No. 5 tone of the scale, the middle gray, which is


FIGURE 30

Illuminated Area

Surrounding Area

FIGURE 31. PRINT FOR SHADOW DETAIL

A minimum printing time (toe-exposure-printing-time) of the thin area being sufficient in intensity to affect the paper emulsion in its "usable" exposure region will produce a quality image. For this reason thin negatives can be printed as well as the normal negative densities.

The "shoulder-exposure-region" of the negative having received only a "toe-exposure-printing" as far as the paper is concerned, it has been insufficient to resolve its densities properly on paper.

assumed to be the No. 4 tone, dividing the two extreme densities into relative components, they would then form a continuous series of contrasts, all within the same region of the scale. (See Figure 30.)

The above reasoning places the three major densities in the middle exposure range of the negative. Ordinarily, that is not essential just as long as such densities conform with each other in contrast. Negatives can be thin or they can be heavy. As long as the relationships between all major densities are harmonious, they will be good printers.

Considering our example negative, Figure 29, again, the necessary control work can be done in one of three ways:

1. Increase the thin area density by intensification or by dye retouching without altering the dense portions. This in theory would be like working with a heavy negative.

2. Reduce the heavy portions to conform with the thin areas. This is like having a thin negative.

3. A combination use of the above two methods for a desired negative quality, which in a sense would produce a printing medium, neither "heavy" nor "thin," but a compromise between the two, namely, of normal classification.

The third control approach is also the safest technical approach in all cases because it concentrates upon doing a minimum of hand work in the extreme regions of the negative, pulling them together towards the "middle."

Figure 32 is another print from the same negative but printed long enough to show an equivalent "key tone" of the highlights as compared to the key of the background of Figure 31. Figure 33 illustrates the degree of neutrality that the thin areas were "raised" by means of dye application to conform to the central dense area of the negative.

An ideal situation in one print would be the combination of the best results of Figures 31 and 32, if it were possible to obtain it during a unit of printing time without "dodging" one area while the other section is "burned" in.

During the control work, a uniform layer of new coccine was spread on the back of the original negative over the entire thin area of subject matter background. This was continued until subsequent test prints produced a result as illustrated in Figure 34.

Figure 31 is a print from the original negative for the most favorable shadow detail and richness of "key." Note how the central portion is under-printed. The relative visual gray scale contrast ratio between the two areas is about 10 to 1.

FIGURE 32. PRINT FOR HIGHLIGHT DETAIL

Increased printing time will produce quality from the dense area of the negative. The thin portion by comparison has received more printing time than was necessary to place its tone key in the same relationship with the effect obtained from the dense area.

Commonly considered as "over-printing," it indicates that an initial "toe-density" has received the same amount of exposure as normally given to a "shoulder-exposure" density. This is wrong. Any "toe-density" region of negative density must not be given any more than a relative "toe-printing-time" that is just within the "usable" portion of the paper's sensitivity.

Using the test print, Figure 34, as a guide, further retouching was done locally with dye to emphasize middle tone and highlight detail. Chemical reduction with the A-B-C Iodine-thiocarbamide reducer on the emulsion side in tiny shadow areas of detail helped to emphasize the black tone.

Figure 35 is the final print, without any dodging or burning-in anywhere. Print spotting completed the processing. (See page 132.)

## *Now Let's Get to Work!*

A solid foundation for thinking about tone values has now been given. At this point we have coupled it with a simple technical reasoning and method of working. If adhered to with any amount of patience, good results will be obtained.

All instruction and information has been purposely kept basic. Only the important issues were stressed. If the reader is able to keep this general instruction in mind while he follows a similar procedure of working, he will have accomplished the most difficult part of negative and print control—getting started!

To help you get started, here's a recapitulation of a working procedure:

1. Select a brilliant, contrasty negative, one that you will not be afraid to spoil should an accident happen during retouching.
2. Divide or catalogue the major density areas of that negative into abstract patches of the gray scale. Note how much more contrasty one area is than the others. Become a "human densitometer" and exercise your judgment.
3. Make a series of small contact or projection prints of the entire negative, but concentrate only upon printing for individual densities to get the best quality of tone and gradation in each, letting the other areas print as they may.
4. Study the individual test prints for only those selected areas. Compare each print with the other and decide upon how many qualities you would like to see together on *one* sheet of paper.
5. Note the difference between the printing times you gave each key area of the negative in order to obtain that quality in the test prints. These "printing ratios" become the clue as to indicating how much more or less dye is necessary in each of the key areas to create a "compromise" printing time so that in your final test print, a definite unit of exposure can be given the negative and obtain on one sheet of paper the best qualities as arrived at individually.
6. Follow instructions for dye retouching and go to work on that negative, always referring to the test prints as you go along.
7. Good or bad, make a final test to gauge your work.

**And above all, practice that dye retouching exercise! Your retouching will be only as good as the foundation of practice you build for yourself! And let's see the results!**

FIGURE 33. THE CONTROLLED NEGATIVE

The simplest approach for controlling negative densities is to raise the "toe" regions, or increase its densities so it balances with the "shoulder" portions of the negative.

The above negative shows this balance after dye retouching with new coccine. It strengthened the thin area for a percentage of "neutral" density characteristics as indicated in the illustration.

The negative is now "balanced" since the effective printing ability of the negative is compatible to densities within the straight line portion of exposure. Although the thin density is visually the red of new coccine dye, its equivalent value to the basic dense area is as though it was "neutral." The ratio of contrast between the two areas is about 2 to 1.

FIGURE 34. TEST PRINT

The test print proves that the percentage of dye layer over the thin area of the negative was sufficient to allow the same increase of printing time in that section as normally permissible for the dense image in the original highlight area.

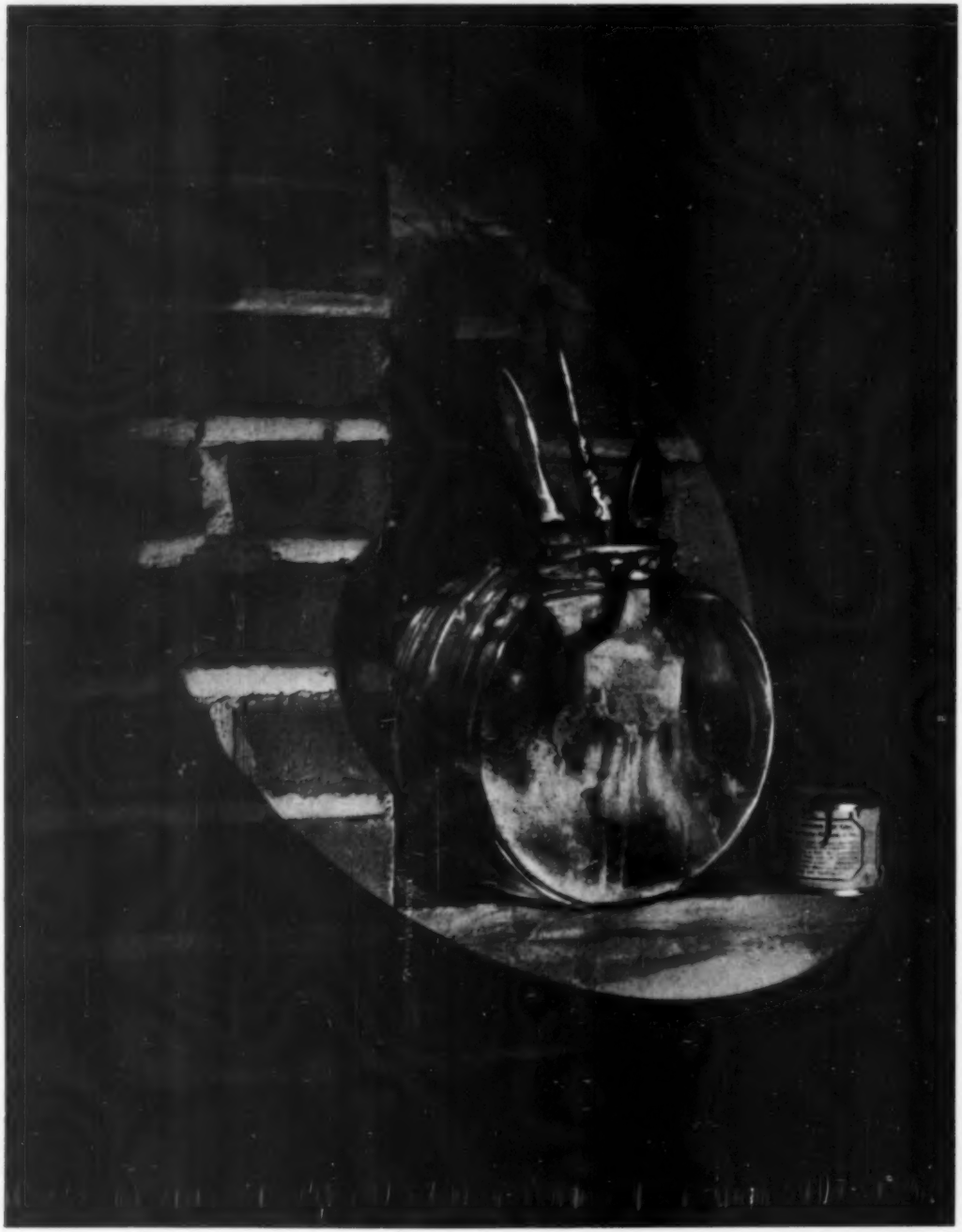


FIGURE 35. THE FINAL PRINT

The basic problem of the two "opposite key" densities corrected, an ultimate quality in the print is achieved by the control of detailed units of subject matter for added emphasis and illusion of a complete long range of tone. Contrasts within smaller negative areas containing the blacks, middle and quarter tones, as well as highlights are exaggerated by further retouching to lend the visual punch that is attributed to a quality print.

# A PHOTOGRAPHIC PROBLEM—*And Its Solution*

R. C. HAKANSON *

READERS of popular photographic magazines will remember the fascinating articles telling about the fabulous equipment, sweat and tears that go into the making of pin-up pictures. What about the poor lad who has to turn out a different type of pin-up picture: a pin-up for an able pleader-at-law to use in selling his case to judge and jury?

Think back to the dour jury members from the last "who-done-it" you saw at the movies. Then put yourself in the position of visualizing a factual record so graphically that they will be able to understand exactly the physical facts of a dispute.

A part of the answer seems to lie in the truth that all types of photographers have to learn their equipment and its use so thoroughly that manipulation occurs only as an afterthought to creation.

We had a particularly impressive problem one afternoon when I had met an attorney at the Warner Testing Laboratory of Case Institute of Technology. His time and that of the staff member we had to consult with were both limited. The problem was to obtain a fine set of pictures showing how an expert had made a series of tests on a Charpy Tension test machine. The expert's testimony was vital to an important law case, and it seemed, in prospect, a dull and difficult story to get over. So we were there to make pin-ups for the jury, to catch and keep their attention while the Ph.D. sold them his bill of goods.

* Member of Cleveland Section, Technical Division, PSA.

One phase of the problem was to dramatize at the same time we illustrated, tying it in with the prospective testimony. We started with a straight-on look at the machine with its pendulum-type striker at the "rest" position, Figure 1. Lighting was by spots on either side at about 45°, very much the type of shot that might be made for the morning police line-up. We then moved lights and camera and showed the device with its arm raised as it would be for a test, Figure 2.

Next came the problem of showing how far the big arm swung. We substituted flashlamps for spots and caught the pendulum-striker at the end of its swing, using a slow enough speed so that we achieved a real sense of motion, Figure 3. The slight unsharpness seemed more authentic than would have the result of high-speed "freezing."

To this point we had used our camera about as you might have used any amateur camera, although we were a little over-lensed for amateur work. The 4x5 Deardorff Triamapro was fitted with an 8-inch Ektar. Right away the view type camera and full covering lens came into action. We had to show a test block in position on the anvil with striker stopped nearby. We made use of the ability of the view camera to retain the illusion of parallel vertical lines by dropping the front of the camera to the extreme look-down position, at the same time keeping the plane of the film perpendicular to the floor. Figure 4 introduces no problems of vision to the viewer, which is exactly what we wanted to accomplish, a fair and clear picture.

In Figure 5 we borrowed movie technique. A close-up

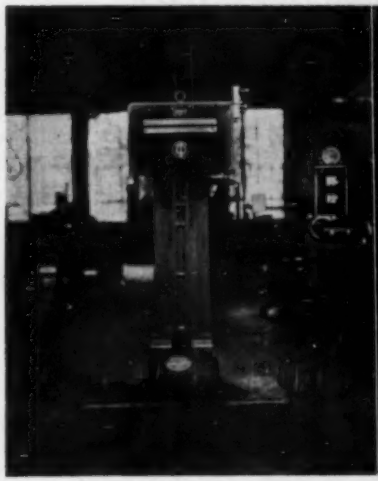


Figure 1. Tinius-Olsen Charpy Tension testing machine, head at rest.

Figure 2. Same machine as (1) with head up, ready to swing.

Figure 3. Same machine with head at extreme limit of swing.

Figure 4. Anvil with test bar in place and striker in safety position.

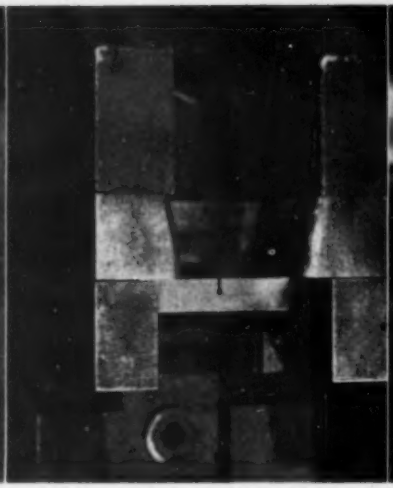


Figure 5. Close-up of anvil with test bar in place.

Figure 6. Inside of striker showing V-shaped piece which hits test bar.

of the star of the show, that test block, was needed. It had to be enthroned on the anvil and ready for tragedy (destruction), so that our friends on the jury would be able to feel completely the impact of its denouement. A few precious moments were taken to get the right view which would show off our little actor to best advantage. Finally, we made the picture with film plane parallel to the floor and with lens board at its extreme rise position.

Now the villain! In the middle of the striker's head was the little V-shaped block. We had to convey the idea of pent-up force. We straightened up and looked right into the middle of the striker as it was slightly above, and caught it gleaming there, all ready to whack the daylights out of an innocent little test bar down below, Figure 6.

The next morning our attorney had on his desk a series of pictures that helped tell the story by which he was prepared to do or die. Our own little pin-ups, for the judge, for twelve good men and true of the jury, were the eyes for blind justice.

# "Let the Show Go On"—*But How?*

NESTOR BARRETT, APSA

AMATEUR movie makers are doing better every day. Their pictures are taking on some of the qualities of the best professional productions—and in some instances excelling them. Those horrible pans which were a characteristic of the "garden hose" school of photography have almost completely disappeared. Bad under- or over-exposure is now a rarity in the movie club contest. In short—even the articles in the newspapers and magazines which made an evening of home movies seem a mild form of torture, comparing favorably with Siberia, have disappeared. Home movie taking has come of age—but home movie projecting is still lagging somewhat behind.

Good home movies are a form of entertainment. We should not, in fact, inflict movies on our friends and neighbors which we know are not as finished a product as we can make. And if we are going to show our movies, let's be forthright about it and give ourselves as much of the advantage of a theatrical presentation as lies within our power. Movies are at best pale shadows of things past. We should heighten the illusion with as much showmanship as we can muster.

You know the fellow who is so awfully coy about the whole thing. He never mentions his movies when he invites you and the wife over for the evening. At the proper cue you are supposed to urge him to show his last year's vacation shots. Then we have the old routine with which all of us are familiar; the dragging out of the projector, rearranging the furniture, cords all over the floor, and as a sort of climax you, who are unfamiliar with the lighting arrangements in the house, get drafted into turning off the floor lamps when the projector is finally threaded. Since not all floor lamps are models of stable equilibrium, this phase of the operation can deteriorate

into a wrestling match in which you are almost certain to lose the fall.

Things can be better than this and many amateurs have attacked the problem with success. Some have built elaborate theater setups in their basements. Others have fixed up the play room or rumpus room to serve a dual purpose. Others have not gone quite so far toward elaborate construction, but whatever they have done serves to point up the fact that there is a need for better projection of home movies which has been recognized by the movie fans themselves. If one may be forgiven for relating personal experience to prove a few points as well as suggesting several devices which can be used to smooth out home projection procedure, perhaps the use of the first person will not be too much out of order.

It seems to me that the minimum we can all attain would be to know in advance which of our pictures we are going to show the guests, and in what order. Granting this we should be able to have the projector out, threaded with the first film, and at least roughly focussed. I advocate having the location of the screen, which is probably mobile, predetermined, and if it is not set up, at least modestly standing in a nearby corner where it can be quickly moved into position and unrolled.

If one of the end tables is to be the projector stand, could it not be decorated with some simple bowl or statuette which can be quickly moved and replaced with the projector? Must it have on it the most fragile and unstable vase the family owns? If sound films are to be shown, could not the speaker cord be unfurled and thrust behind the sofa in advance, requiring only the ends to be quickly connected? Being one of those fortunate individuals who had the chance to second guess this problem when I built the modest home we now have, I was able to include a few features which have made movie projection smoother and more comfortable for our guests. Some of the illustrations show what was done.

My den is placed so that a door from it opens into the end of the living room. This gives an opportunity to set up the projector in the den. I can get everything ready to run, close the door and greet my guests without any evidence from that part of the house that a show is in preparation. This is not for the purpose of sneaking up on the intended victims, but to please the feminine sensibilities of the lady of the house, who does not relish arriving guests getting their first impression of our home as something akin to a machine shop.

The projector setup is shown in Figure 1. Observe the stand which has been covered with a cloth to conceal its rather out-of-date and ugly under-pinning. Figure 2 shows the cloth thrown back from the front so that you can see that it is a former calculating machine stand, two of which I got from a second hand dealer for $5.00. I cut off the slanting top with a hacksaw, and bolted on a sheet of plywood. This type of stand (circa 1925) has both wheels and feet, either of which can be utilized by turning a lever from side to side. You may observe also in these

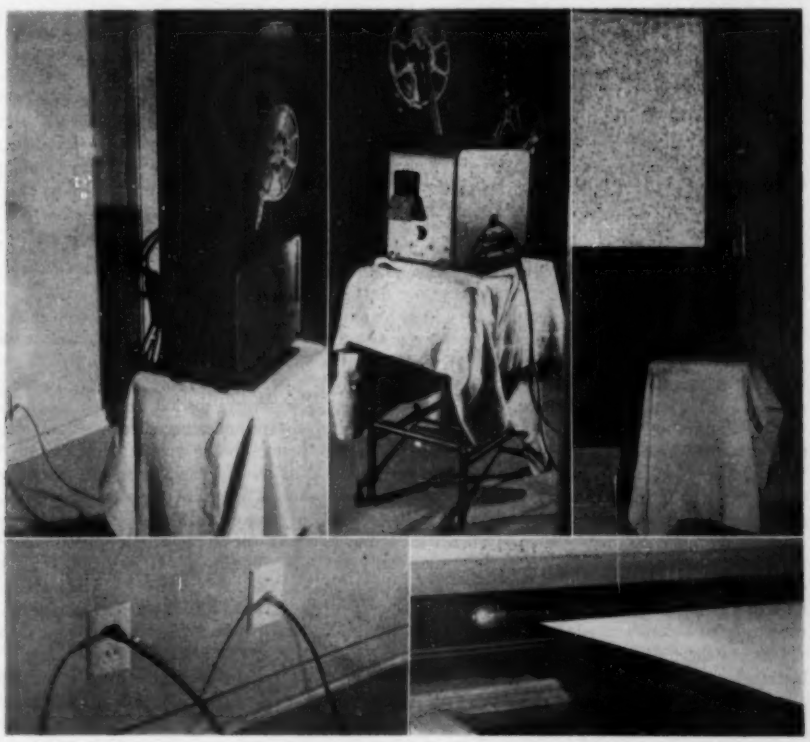


Figure 1 (Top left)—The projector setup. Figure 2 (Top center)—The projector stand. Figure 3 (Top right)—The speaker outlet plugs into wall at right. Figure 4 (Bottom left)—Detail of plug and outlet. Figure 5 (Bottom right)—The screen is hung behind the drapery valance.

figures the black typewriter cushion which is helpful in muffling the projector noise. In practice it should be put under the cloth; it is outside in this picture for ease in photographing.

You may also note in Figure 1 that two cords disappear into the wall, one the conventional electrical outlet and plug, and the other the sound cord which leads to the speaker. Built into my house is a conduit which leads from this point to a similar jack in the front living room wall into which the speaker is plugged. A detail of the plug and outlet is shown in Figure 4, while Figure 3 shows the outlet for the speaker near the screen.

My personal experience may help others who will want to duplicate this feature. The house plan called for a conduit and six-wire low-voltage cable to be installed as part of the contract. The conduit is not needed electrically, but the building code requires it. On checking over the bids it was discovered that the electrical contractor had put in $300 for this part of the job. This was ridiculous, of course, so we eliminated this amount from the job. When the house was being wired I had approximately the following conversation with the foreman:

"How much will you charge, as an extra, to put in a six-wire cable from the den to the front living room wall?"

"Well, that six-wire cable is pretty expensive—"

"Omitting the cable, what will you charge to put in the conduit, and pull the cable through, if I supply it?"

"Oh, the conduit is nothing. We'll put it in for $18."

"Good," I said, "Do it then. I will get the cable from a mail order radio house for six and a half cents a foot. How much will it take?"

"Never mind," said the contractor turning to his helper. "Here, Joe. Go down to the wholesale house and get me 40 feet of six-wire cable." Turning to me, "How's $25 for the whole job?"

Why did I specify a six-wire cable when many projectors require only two wires on the sound system? Two reasons. At the time the house was wired I did not know what sound projector I would buy, and some that appealed to me had four wire circuits. Secondly, I wanted extra channels in case some use for a tape recorder or microphone developed. An unlimited number of jack and plug combinations can be obtained in radio supply stores, so that complete flexibility in the use of this cable can be attained.

Another helpful idea which requires very little planning in building a new house is to arrange the drapery valance so that it is placed out from the window a little extra space to accomodate a screen underneath, as well as the drapery. My screen is placed in front of the drapery track, (Figure 5) since it is hung next to a large plate glass window which looks out into the garden. Six inches is ample for a 60 x 60 inch screen. Large wire hooks can be screwed into the ceiling behind the valance board, allowing the screen to be lifted down if it is needed temporarily in some other location. When I show movies the screen is pulled down into exact position as easily and quickly as a window shade. Having the screen in a fixed position makes possible the precise pre-focusing of the projector before any guests arrive.

Next to the projector on the den wall I have a switch installed which, when put in "off" position, turns out all the lights in the living room, including all floor lamps. It is thus possible to have the normal room light in full use up to the moment the projector is turned on, at which time the illumination is in full control of the operator. No more hammer locks on the bridge lamp in our house. Incidentally, for those who may be planning homes, a similar switch is also placed in my bedroom, so that I no longer have to stumble over the furniture in the dark, in order to make my way successfully from the living and dining room after the cat has been put out for the night.

A brief word might be in order about club projections. Some camera clubs have mastered the fine art of giving a good show, some have still a few things to learn. The San Jose (Calif.) Movie Club Annual Salon is a model of showmanship, and now so popular it has to be run for two nights to accommodate the crowds. But it is no odd coincidence that this is so. No showing is so carefully planned as this one. A full dress rehearsal is held the night previous, and apparatus is set up and in good working order several hours in advance of the showing on each of the regular nights. Spectators get a strong feeling of a theatrical performance as can be seen from this flash shot (Figure 6) made during the 1950 show.

I remember reading one time a glowing enconium to the benefits of roller skating. It would make the thin fat and the fat thin. If a girl was plain, it would make her look like an angel, in fact it would make her an angel directly if she couldn't skate well. If the noisy art of roller skating can be made attractive, surely our movies which have in them the breath of life can be made warm and glamorous by a little close attention to the setting in which they are presented—giving them, in short, a handsome gilt frame, rather than the appearance of thumb-marked snapshots tossed into the corner of a forgotten bureau drawer.

# Simplicity Does It

THE "OLD DOC"

LET'S KEEP amateur motion pictures simple!

There seems to be a growing tendency to shove amateur movies in with all the other complexities of this modern age. There seems to be a growing inclination on the part of filmers to doll up their movies with fades, wipes, dissolves and other effects. Many amateur filmers approach their filming grimly conscious of the fact that the eyes of their fellow filmers are upon them — that their cinematic reputation is at stake with each picture.

Away with such unpleasant thoughts! This is no plea for sloppy filming, indifferent camera work or careless editing. But let's film for fun. Let's measure our work with a yardstick which will allow us to have some pleasure while we are filming. And let's judge our work — and the other fellow's work too, with a tolerant eye and a gentle tongue.

So, if you are interested in making good motion pictures without resorting to fancy effects, indulge in this pleasure without shame. If you are a gadgeteer — a home inven-

Figure 6. San Jose Movie Club Annual Show, 1950. Photo by Earl Brisbin.

tor — that is something different. You can hang a lot of weird apparatus on a motion picture camera, but it is highly questionable if such tactics will result in better motion pictures.

The amateur who buys his first simple motion picture camera can reassure himself with the thought that he is buying the fundamentals of good photography without the frills which might actually be a hindrance to his budding ability to make good motion pictures. There is nothing wrong with good sharp pictures. There is nothing wrong with the straight-away type of picture which cuts crisply from scene to scene. There is nothing wrong with a picture which may lack entirely the trappings of so-called artistry.

The element of simplicity in movie making does not preclude good planning, development of an original type of approach to the subject matter, careful camera work and endless hours of effort in cutting and arranging scenes and sequences for the best possible effect. All this is instructive, progressive and is in fact as integral a part of amateur movies as the actual shooting of the film.

Simplicity, however, is more indicative of good motion picture technique than almost any other factor you can call on. Too much elaboration, the use of too many "gimmicks" and distracting effects are, in many cases, signs of a lack of technique — a lack of a proper, well clarified approach to amateur movie making.

Not long ago I heard a filmer say: "I'm pretty limited, of course, because I work only in eight millimeter."

It took the "old Doc" some time to sell this fellow on the idea that basically he had the same tools with which to work as any one else. Screen size does not limit the effectiveness of a motion picture. The small film can carry the same brilliant thoughts to the screen as the large film.

The fellow who sagely remarked that we make motion pictures with our heads—not our cameras—was concocting a reasonably good truism. Because in filming, we are not simply putting random images on film—at least we hope we are not—we are putting thoughts reflected by images and action on the film. Even the simple home movie bears this out. Most of our home movies are built around the thoughts of love, parental pride, pride of possession, humor, pathos and other kindred things which crop up in our daily lives. These elements are mirrored in a very attractive form in a well-made simple home movie. All the artificial props in the world will not add one iota to the charm of such a film. A picture of this nature may be as well made with an inexpensive motion picture camera as with the type of outfit running into many hundreds of dollars.

Of course, there's nothing wrong with having an elaborate outfit if your taste so dictates and your pocketbook acquiesces. But there's nothing suffered by the little outfit if you subscribe to the philosophy of keeping it simple.

As long as you remember to have fun with your picture making, your pictures will undoubtedly reflect this quality and your friends will have fun seeing them. Of such stuff is true success made.

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## *National Lecture Program*

If your club is one of those in out of the way places and you feel you never get the opportunity to see or hear from the really important people in photography, don't pass up this opportunity! If you are located west of the Mississippi, you are going to have a chance to see and hear P. H. Oelman, Hon.PSA, FPSA, the real master of photography of the nude.

Mr. Oelman is not only one of the finest craftsmen that the field of photography possesses but also one of the most able administrators. He is a Vice President of the PSA directly in charge of conventions, exhibitions, membership relations, and the National Lecture Program, all important functions of the Society.

In his capacity as Conventions Vice President, Mr. Oelman will be attending the PSA Regional Convention in Santa Barbara, California, in June. On his way from Cincinnati to California and return Mr. Oelman plans to present his famous program, "Photography of the Nude," to those aggressive camera clubs and organizations that make arrangements through the National Lecture Program. If your organization is interested in sponsoring his appearance, contact the chairman of the NLP immediately to determine if your location could be included in Mr. Oelman's itinerary.

While you are reading this column David Darvas, APSA, will be well along on his tour through the Middle Atlantic and the Gulf states.

Newcomers to photography may not be familiar with the pictures of Dave Darvas but those of us who watched the salons ten years ago have never ceased to marvel at his technique in producing prints of unequalled quality. Dave held the record for the most prints exhibited during the year 1942. Since that time Dave has done little exhibiting, preferring to devote his time to teaching and demonstrating his methods and techniques. He has been an instructor in photography in schools in both Detroit and Cleveland. Last year he made a tour through some of the Southern States where his message was so well received that he is being called back again this year by some of the same clubs.

Clubs in the Midwest are already scheduling Barbara Green, APSA, for her tour which will begin early this spring. Barbara Green is one of the most engaging personalities in the field of photography. Proof of this fact is that many of the clubs in the East have invited her back to speak three and four times and she was the first woman to speak before the Franklin Institute in Philadelphia. However, nearly all of her appearances have been in the East and other camera clubs will now have the good fortune to see and hear this outstanding writer and photographer. For further details concerning the securing of Barbara Green for a speaking engagement contact the Chairman of the NLP, Jack Clemmer, Box 548, West Richfield, Ohio.

HER MAJESTY'S GUARDS — John T. Sipes

*From The 1950 PSA International Exhibit of Photography*

# THE FOLIO Volume 4, Number 3

*Devoted to News of the Pictorial Division of the Photographic Society of America*


## *Just About the Folio*

Last October we announced a competition to rename this section of PSA JOURNAL, since many Pictorial Division members did not realize that this was the news outlet of the Division. Because of mailing difficulties, we have had to carry announcement of the winner of this contest over to next month.

But, regardless of the name, *let's talk a bit about this section*—now called "The Folio."

Those of you who are regular readers know that through these pages our seven Associate Editors bring to you each month news about the various activities being offered by the Pictorial Division, and reports on the experiences of both individuals and clubs who have participated in these activities.

If you want to get the greatest possible value from your PSA membership, you participate in at least one activity. And if you enjoy that activity, you urge your photographic friends to find a similar enjoyment for themselves by participation. If your club is in a rut, you arrange to participate in one of the club activities offered to stimulate your group. "The Folio" tells you what is available, and something about how it works, so that you may intelligently decide the activity which will benefit you the most.

Let's look at the masthead of this publication. It appears in the double column at the bottom of this page. Here in one handy list are the names and addresses of the Directors of each of the activities of the Pictorial Division. These are the people you should contact for more information.

Every month through the pages of "The Folio," the Associate Editors try to give a small idea of the friendliness, the help, the pleasure, each of you can get from their activities. Since it is impossible for us to sit down and chat with each of you every month, the seven Associate Editors and I visit with you through these pages.

Not only do we try to help with your problems of getting the most from PSA membership, but we also try to pass on little hints for your own photographic work. Don't photographic friends always do that? You talk a while of activities and the benefits you get from them, and then the conversation turns to an easier or better way to conquer some problem. We of "The Folio" want to be good friends to each of you, not only by telling about interesting ways to help yourself get more from photography, but also by passing on interesting photographic hints to make your work easier and better.

But friendship cannot be a one-way proposition. You can not only *take;* you must also *give*. If you are to take from any activity the best that is in it, you must give the best that is in you. Participation in any activity is not the end result—it is only the means to the end. The end result is achievement towards your personal goal, secure in the knowledge that you have given and done your best.

If, together, we are to produce the best possible news outlet for Pictorial Division activities, you, our reader, must help. You can help by letting the Director of the activities in which you participate know how you feel about them. If you can suggest a way to better any actvity, let that Director know about it.

If "The Folio" is not meeting your needs, let me know about it. My address is in that masthead, too. Let me know what you would like to have it do or contain, and I will do my best to see that your suggestions are carried out. "The Folio" exists only because it can serve you.

From the standpoint of numbers, the Pictorial Division is the largest single Division in PSA. By working together, we can make it the strongest and the best Division in PSA. Are you willing to do your part?

—STELLA JENKS, *Editor*




DR. GLENN ADAMS, APSA, *Associate Editor*

When the Royal Show arrived from

England two years ago, I did not realize that it was destined to become the most sought-after exhibit in the whole group of shows which are now in America from foreign lands. But it was, and when it was finally returned to England, the prints were dog-eared from so much handling. I apologized to our British friends and they accepted my explanation in the most gracious fashion, by promptly assembling another and more beautiful exhibit, which has now arrived on these shores.

Those who see this show will agree that it is tops in pictorial photography. The same can and has been said about the Francis Wu One-Man Show from Hongkong—or the new exhibit from the best in Sweden—or the just-arrived exhibit of Netherland photographers—or the Mexican show.

They are all yours for the asking. Plan ahead. Plan a night in March or April and spend the whole evening at your club viewing one of the lovely Foreign Exhibits. Invite your friends or perchance another friendly club or two. Admire the prints, criticize them too. No one will be angry. The makers are too far away!

Realize too that the prints are the work of men and women in far away lands, with different customs, different materials and different viewpoints.

Our shows sent abroad will undergo the same searching scrutiny. Some of our techniques will please and be imitated. Some of our choices of subject matter will amuse and astound. Some of our efforts will fall flat on their face with a thud. Some will inspire them to better work.

When you send the prints back to Fred Kirby, don't forget to send a package of your club stickers along. These will be sent to England or Hongkong or Australia, when the show goes home. That is little enough reward for the fellows who make the prints—who sweat them out by the hours like we do with our own pictures.

Viewing a Foreign Exhibit is similar to travel. The scenes are not like America, the people in the prints look and dress differently. When you see one of Francis Wu's prints that shows an old Chinaman smoking a cigarette down to the last sixteenth of an inch by holding it on a pin, and then look at a morning-after ash tray in your own living room, you will realize what I mean. Or when you see one of the Swedish prints showing a snow scene in the country-side of that Northern Country, and realize that the maker printed it in a warm tone on buff paper, by design, you will believe that to them, at least, snow is warm looking, and perhaps warm feeling, just as it is to the sled dog who sleeps buried deep in the snow with only the tip of his nose showing.

Photographers in other lands do not copy our pictures. We can not copy theirs. Their lands are different. Their people do different things in different ways. They may show a child driving a dog-cart. We might picture our new Cadillac. But the dog will drag the little cart through the mud safely, while the Cadillac owner might have to call the Automobile Club to drag him out.

But people are the same and photographers all over the world have been showing sorrowing women, happy children, men intent on their work, ever since photography came along and made it possible to record moods and character and the lives of all of us.

Study those foreign prints. Don't leaf through them in a hurry. Look at the lands. See how their home differs from ours. Try to understand why the print was made. If you like it, and you will not like all of them, try to find out why. What does it do to you?

Instead of hurrying these prints through a light box, why not show them on the wall of your club? Have the members vote on them, and pick the best. Show them one at a time and comment on them. Then if one of your competent members would take notes of the comments and write it up in a commentary—would that not repay them for their work? After all what do most of us get for our pictorial efforts? Not a thing, but the thrill of some one looking at them and liking them. Of course, some kind photographer friend gives us a kick in the teeth once in a while. And once in a while we deserve it. We are discovered with a bad technical job or a silly merger or a pink spot on a blue toned print. All of which we fondly hoped no one else would see. But these mistakes are always pointed out on mine and I suspect yours have the same fate. You can do this to the foreign prints. You can open your mouth and squawk your objections to the roof tops. The maker is in Mexico or Cuba and he will never know.

See these foreign shows. Do not think that they are not worth while. This service of the PSA is yours for the asking. And it is only one of the many advantages of membership. Get beyond thinking that being a photographic hero in your own block is all there is to photography. Look and learn! Top notch photographers who study a print and what lies back of its making, always learn something. Maybe it is "what not to do," but even that is worth while.

## AN INVITATION

**This is an invitation to every PSA member to participate in the PSA American Portfolios.**

**Enrollments are now being received in the following specialized groups:**

- PSA Pictorial Portfolios
- PSA Portrait Portfolios
- PSA Miniature Portfolios
- PSA Control Process Portfolios
- PSA Star Exhibitor Portfolios (For PSA Award of Merit Winners)
- PSA Nature Portfolios
- PSA Photo-Journalism Portfolios

**For information concerning any of the foregoing activities and for enrollment blanks, write to the Director of the PSA American Portfolios, Eldridge R. Christhilf, Hon. PSA, APSA, Suite 406, 800 Davis Street, Evanston, Illinois.**

# The International Portfolios

DR. WM. F. SMALL, APSA, *Associate Editor*

Ray Miess has sent in the following news from the Dominican American Portfolio secretary, Sr. Juan Ulises Garcia:

On the 12th of October I had my passport ready and reservations on Panamerican Airways. I was ready to go to Baltimore to attend our PSA Convention. But the trip became impossible betause of my health, which, even though improved, did not permit me to make this wonderful trip.

In the meanwhile, and being still in bed, our Dominican American Society awarded me the title of Honorary President for life, and on the 4th of November I was well enough so that I could attend the celebration of our second anniversary which falls on the 9th of October. They retarded this celebration to give me the opportunity of attending the meeting, which was really wonderful.

Three Dominican girls attended as models, and everybody had the opportunity of taking pictures, as I did too, but not with very good success.

Last Monday we had a round table to discuss a very interesting theme: "What is the meaning of 'Normal Negatives.'" I had the opportunity of talking about the mystery of light, the relation between colors and the grays of prints, contrast, tonal values in prints, etc. My oppositors were Mr. Maximo Pou, Dr. Carlos de Moya and Mr. Tread. Mr. Maximo Pou presented a very interesting problem, that of light in the shadows of tropical countries. He said that our shades are soft and less dark than in countries to the North. But even with this softness in our shadows, contrasts are terrific!

Dr. L. L. Handly, General Secretary of the International Process Portfolios, writes of the formation of an International Portfolio on Pigment Processes that is well on its way to completion.

Mr. J. Bell of Accrington, England, is Secretary of the British section. Mr. Burton, Bob McFerran, Ralph Ross and Herman Getz are among the American members. If there are any bromoil, gum or transfer workers that would be interested, they are asked to write to Dr. Handly at 716 West Alabama Avenue, Houston 6, Texas.

Mr. Bell reports so much enthusiasm among kindred souls in England that they will soon have enough for another circle. There are plenty of us in the U.S.A.—now is the time to get acquainted with each other. So come out of your dark corners and let us hear from you.

Did you ever hear of making gums by projection rather than over contact size negatives? An English member does it. Full opportunity will be given to chew the fat about processes in this portfolio.

The first American circle is almost complete; but Dr. Handly intends to keep a waiting list, either for other circles or for replacements. We may need replacements to prevent any unnecessary delay in the circulation of the portfolio.

Recently a lone process worker wrote to Dr. Handly for help and sent a specimen

that was better than he had ever done (or so he says). No doubt others working alone are better than they realize. If you want to join and are doubtful of your competence, or are on the fence, write and send him a sample of your work, which will be returned.

Dr. Handly also writes that Daniel of Somerton, Arizona has gotten a dealership from abroad and can furnish good bromoil inks, papers and brushes at reasonable prices. He says the above address is sufficient to reach him.

RATT KURS "Petrus"

*From the Swedish PSA International Exhibit of Kungsbacka Fotoklubb*


MISS EVELYN ROBBINS, *Associate Editor*

## *Chirps From the Robbins*

The other day when talking to a prospective PSA member, I tried to sell him on joining a PSA Pictorial Portfolio. It amazed me to hear him say, "I can't. I'm just a beginner, the rankest of beginners. I know practically nothing about photography." He was anxious to learn though, enough so that he wanted to join PSA. I wonder how many others feel the same way?

Perhaps there are others who do not know about the pictorial portfolios and what they have to offer. With this in mind, here are some excerpts from the folder that has been put out with a complete description of this activity of the Pictorial Division

There are two excellent ways to improve your knowledge of what is good and what is bad in a picture, by reading studies that have been made of your own work and by writing analyses of other peoples' prints. Of the two methods, the latter is the more educational and the more important.

When you join a PSA Pictorial Portfolio you submit one of your best prints, not over 8 x 10 in size (a few are still 11 x 14) with a description of how you made it and perhaps the reason why you made it. This is placed in a portfolio, along with the prints of the other fourteen members of the Circle, each from a different part of the country, and is sent by express to each member in turn along a straight line route.

The portfolio finally arrives at your home and you can keep it for five days, during which time you are able to study the comments made by the other fourteen members about your picture, and you in turn will discuss all of theirs. You will find that there are members of the Circle who are keen on technique, others who have a knack for composition, some who are able to point out the reason for something about your print that has been puzzling you, one or two who may not know much about photography as yet, but who have interesting viewpoints and worthwhile suggestions to offer.

At the end of each Circuit the portfolio is sent to a Commentator, one of the top flight pictorialists of the country. The Commentator will offer suggestions to the makers of all the prints.

Each time the portfolio makes a new Circuit, and you will receive it about two or three times a year, you take out your old print and put in a new one. Each time around you will notice how all the pictures are getting better, including your own. You will be looking forward to the pleasant five days you will spend with your new friends, working together for the good of all.

It is impossible, of course, to quote the entire folder; but if I quoted nothing else, I should like to quote this: *"You are going to meet some nice people and make some interesting friends."*

Those who already belong to the portfolio activity will agree that the above is completely accurate; and those who still have not joined have a wonderful experience ahead of them. Portfolios are for everyone!

## *Random Thoughts*

ELDRIDGE R. CHRISTHILF, Hon.PSA, APSA

The world situation is having its effects on the PSA American Portfolios for hardly a week passes that we do not receive word that some member has been called back into service. Among the latest are F. C. Allen, of Oak Ridge, Tennessee, Circle Secretary of Pictorial Portfolio No. 46, who, as Captain Allen, is now located at Alexandria, Virginia; Dr. Robert W. Myers, Newton, Kansas, a member of Circle No. 31; and Dr. Charles E. Gray, Berkeley, California, a member of Circle No. 30. To all who are thus called we wish the best of luck and hope that before too long they will be able to rejoin their old Circles once more.

This brings us to the point where we must issue a call for volunteers. We are badly in need of volunteers for the post of Circle Secretary on many of the portfolios. If you wish to help please drop me a line. If there is no vacancy at the moment, your card will be kept on file and when a vacancy does develop we will call on you. A Circle Secretary should have a typewriter available and should devote two evenings a year to setting up the portfolio and a few minutes each week in recording the arrival and departure of the portfolio at each stop. One thing is sure—you will get even greater enjoyment out of your portfolio membership as it will put you in closer touch with your fellow members.

We still run into embargoes that completely foul up portfolio schedules. Often these embargoes are not widely publicized and few realize that such embargoes exist. We recently had a wildcat railroad strike here in Chicago that resulted in an embargo being clamped on all outgoing and incoming express. When we run into such situations there is not a thing that we can do but to wait until such embargoes are lifted and shipments move again. We can only hope that the embargoes will be of short duration—sometimes they are as in the Chicago case and sometimes they are not as in the case in New York this past Fall.

John Hogan has come up with an idea we would like to have all portfolio members adopt. When you have shipped your portfolio do not sit back until it is almost ready to arrive again to make up your new print. Get busy at once. Make a print from the negative that you have selected. Study it carefully and remake it time and time again, each time seeking improvement. Then when the portfolio does come you will have a really good print ready. That is much better than grabbing into your discard pile and coming up with any print at all just so you can have one in the portfolio. Remember, your print should be one that you are proud of and one that you will not be ashamed to have shown at camera clubs all over the U. S., for the portfolio prints *are* being shown at many camera clubs in their travels.

### *The Correct Address*

In July 1949 the mail address of the PSA American Portfolios was changed to Room

406-800 Davis Street, Evanston, Illinois. Announcement of this address is carried in "The Folio" each month. In spite of this, mail is still addressed to the old Ravenswood Avenue address in Chicago, and, as my business office is no longer at that address, such mail is delayed greatly in reaching me. In some cases mail has been returned to the sender, through error on the part of the Post Office.

To insure prompt delivery all mail intended for the American Portfolios should be addressed to: PSA American Portfolios, Room 406-800 Davis St., Evanston, Illinois, or to me at that address.

### *PSA Portfolio Medal Award*

It is getting to be a habit with those portfolio members in California—our Portfolio Medal Award winner this month is again a Californian. This time the medal goes to Max W. Sorensen, of Fresno, California, a member of PSA Pictorial Portfolio Circle No. 22, whose print, "A Page from Jane Eyre," had travelled in that portfolio and was later accepted and hung in the 9th Victoria, B. C. International.

The winning picture was taken on DuPont 428 Pan Film using a 4 x 5 Crown Graphic with 135mm Graflex f/4.7 Optar lens. The exposure was one second at f/32 in the late afternoon with light filtering through thin clouds. The negative was developed in Defender 2-D Pyro-Metol Developer for 5 minutes at 60°. The print was made on Velour Black developed in 55-D. It was a straight print from the original negative, using the whole negative.

Max had just finished reading for the third time the book, "Jane Eyre," and was impressed by the vivid description of the countryside where the story takes place. On a short wandering picture expedition in the foothills of the California Sierra Mountains he came to the top of a small rise and the scene, as photographed, presented itself to him as vividly as the page of the book of which he was thinking. He knew that the scene could have only one name and is convinced that the name is the main reason the picture has had the success that has come to it. The late beloved Frances Robson, in judging prints at Max's club, remarked that the print should be the frontispiece of the book. She encouraged Max in joining a PSA Pictorial Portfolio and to later send the print out.

There are still more medals to be won. If you have not as yet qualified for one, there is no time like the present! For the benefit of new members the medals are awarded to members of the PSA Pictorial Portfolios who have never previously had a print of any kind accepted and hung in an International Exhibition. To qualify for the medal award the first print that you have accepted and hung in a recognized International Exhibition must be one that has travelled in a PSA Pictorial Portfolio, or *is* travelling in a PSA Pictorial Portfolio prior to its acceptance. When you qualify for the medal award merely drop a card to me and an application form will be sent together with instructions.

A total of 100 beautiful bronze medals have been donated for distribution. After all medals have been distributed the prints that won the 100 medals will then be judged and to the winner in that judging will go the Booth Tarkington Gold Medal Award. If you are a serious worker you should break into this winning circle and secure one of the bronze medals and thus later compete for the beautiful gold medal that was donated by Donald Jamison, of Indianapolis, in memory of his uncle, the late and beloved Booth Tarkington, who also was a member of PSA.

JANE EYRE — M. W. Sorensen

## *Comments of a Commentator*

THIS MONTH: DR. C. F. COCHRAN
COMMENTATOR OF CIRCLE NO. 67

The first thought which occurs to us when we consider the portfolios is what a wonderful thing they are in providing assistance for a struggling photographer in the attainment of photographic and artistic excellence. This is not to be underestimated but there is another consideration which we are liable to overlook which has for an end only the feeding of vanity. The portfolios provide an audience for the photographer, for the artist, if you please. Any form of creative expression, musical or dramatic, graphic or plastic, must nourish vanity by an active and expressed audience appreciation.

Perhaps this bald statement needs a little elaboration. Any person who produces an artistic product, such as a beautiful photograph can be, can admit to a certain amount of vanity and still retain a polite amount of modesty. This may sound a little paradoxical but it is true nonetheless. It is all well and good to say to yourself and anyone else who will listen that you make pictures to please yourself and fie upon whatever other people may say or think. Moholy Nagy in his definition of art states, in effect, that art is only art when it evokes an emotional response from at least one person other than its creator. This predicates an audience and an appreciative one no matter how small. You must admit at least one other to your ivory tower. Universal acclaim is not needed but a recognition of your perception and ability is a must if your work is to be of artistic merit. Of course, this statement presupposes that your aim is artistic merit.

The finest piece of photographic art is as naught if it never emerges from the precincts of the darkroom to be viewed by another. Beauty, they say, is in the eye of the beholder. So a thing of beauty requires a beholder. The maker of the thing of beauty cannot serve as the only beholder since he is probably prejudiced, and rightly so.

And so by the time a print travels the rounds of the fifteen members and the commentator of a portfolio it has jolly well been beheld. It is a rare print which completes a round without at least some word here and there of appreciation. If a print were to travel the circuit and receive nothing but rejection, it is quite likely that the maker did not hold a very high opinion of it himself when he included it. If only one member of a circuit gets pleasure and an emotional response from a picture, the audience is supplied and the maker has accomplished the prime requisite of art. Of course, by this standard an extremely poor work may qualify, but if it does afford pleasure or some emotion it is still, in a limited way, art.

Sometimes we see a picture which we consider in very poor artistic taste displayed on a wall. Of course, none of *your* friends hang up these terrible old chromos and enjoy them. But some people do hang up the cheesiest and corniest calendars and clippings and enjoy them because they consider them a "pretty picture." Okay. No matter how bad a picture may be by any existing "artistic standards," I think you will agree that if the picture affords pleasure and satisfaction, then for that person the picture is art. But I think that you will also agree that the more intelligent the audience which approves, the more valid is the criticism. It is one thing to please an illiterate migrant worker with a picture and another thing to please a person of discrimination, taste, and experience such as a judge, a magazine editor, or the commentator on your portfolio.

Not every photographer can find audience in the exhibitions. I believe that the average of prints accepted from those submitted is something less than 25%. This means that if everyone submitted the allowed four prints and each one had only one accepted there would still be a few disappointed entrants. But some of the entrants have two, three, or even four acceptances. Someone is left out in the cold. The average of acceptances in publications is even less. But in the portfolios everyone is provided with a helpful, sympathetic, and photographically intelligent audience and for some of us this is as important as advice about how to crop an inch and a quarter off the right side.

## *"Star Dust"* *

ROY E. LINDAHL

More about the salons and museums by A. Aubrey Bodine, FPSA: The new print

* A monthly column devoted to the "Wit and Wisdom" of the stars as taken from the Notebooks in the Star Exhibitor Portfolios.

in the folio was made ten years ago, but has never been shown until recently at Boston. The reason I have not exhibited it is because I doubt that it would hang more than six out of ten times with the present calibre of judges. If it was to be judged before a jury of trained artists it would have been first on my list, but why send it when I have trashy Maxfield Parrish types around—another step backward, of course.

If one or two artists were on every salon jury it would be a Godsend for photography for a year or two. There would be a lot of beefing for awhile, but it would be the best thing that happened in 25 years. We are stale and I mean stale—absolutely no vigor. There are any number of perfectly grand people, many my close friends, judging salons today, but they have no ability whatsoever to judge pictures that are to be hung in an art gallery. There is more than just honor in judging photographs. The responsibility is considerable, for what is accepted definitely sets a pattern for future works and sets a trend sometimes for years to come.

When I first started to exhibit there were master photographers and real artists who produced magnificent camera studies. Their slow color blind plates and poor papers kept them from achieving technical perfection that most of us acquire without too much difficulty with the present day methods. I, along with many others, have fought hard to have art museums recognize photography as a creative art. I can't tell you how disturbed and disillusioned I have been in the last few years to see the salons go down. Nearly every competent professional photographer has ceased to exhibit because of incompetent judging and I mean incompetent. I have not made any notes other than mental ones, but read this carefully and remember that this has been undone during my exhibiting experience, and you can't help but realize that something is radically wrong with salons.

The decline—as follows—

*Richmond*—Tossed out of the Art Museum this year.

Fred Archer wrote me that the Art Director was about to toss them out of the *Los Angeles* Museum after 35 years.

*Chicago* Art Institute will no longer tolerate the trite trash. I drove out to see my prints there during the World's Fair and felt very proud to be among the exhibitors.

*Boston*—the city of culture—hangs their show in their isolated Club Quarters.

*Philadelphia* tossed photographs out of the Museum some years ago—the last show they sponsored was in a branch in Upper Darby.

*New York*—the largest city in the world—Out.

*Washington, D. C.*—Out.

*Baltimore* will probably go soon. The Art Director made a very pointed remark this year: "I hope the show is modern," meaning stop the cat, dog, potato and other trashy stuffs.

This list includes almost every major city in this country. Someone is wrong somewhere, and I claim it is the absurdly unqualified calibre of judges. It will take years to recover the ground that has been lost. At this point, I can hear grumblings that the salons "pack 'em in"—and so would a caged monkey in the foyer, but the fact is we have slipped very badly. Those who are seriously interested in art have lost all respect for what I think is a creative art as well as the greatest hobby in existence.

Let us consider the painting by Vermeer, "Lady with Lute," now hanging in the Metropolitan Museum—I would like to hear from all—what chance would most of us have before a jury if we composed a picture like this? The first thing—she is looking out of the picture, her eyes are not following her hands, the map over balances the right side, the lute merges into the map, no detail in the table and so on. I can hear the wizards expounding their learned opinion, now.

This brings to mind P. H.'s "Studio Window," certainly one of his best. Some years ago, I remember seeing him just after Detroit bounced it. I would hate to think of what would happen if the composition were similar.

Just in passing I would like to mention an incident that took place at the Baltimore Camera Club recently. The Club's most active and prolific worker had a lovely snow scene. I casually suggested trimming off an enormous solid black tree trunk and leave the lacy delicate limbs to frame the scene. His instant retort was "you can't do that, you must show what's holding the limbs"—I thought quickly and asked "what's holding the tree up"—and his answer was just as quick "why roots, of course"—I suggested that we get an excavating machine to prove his contention. The point I want to emphasize is that this person has been teaching classes for years in the Club and has a great influence on new workers. I later learned that it was an accepted fact among other members that all pictures showing limbs without tree trunks were automatically considered poorly composed. This is hardly an isolated case, but similar conditions exist throughout the country. It is simply poor guidance and yet no one is directly to blame. Fraprie has a fine article in the 1948 Annual. On page 14 is a lovely scene, as he tells, it has suffered at times due to ignorance. Note the limbs on Page 27—this is all wrong according to Baltimore standards.

This could go on forever, and things will continue to get worse unless something is done. Certainly, the most optimistic person can't help but be disturbed over the disrepute into which photography is sinking. How about it P. H. and J. H.? Give this some thought, as both of you are the ablest and most influential in the pictorial world.

In closing, I do want to make it clear that there are many sincere, competent judges functioning throughout the country. but what can one qualified judge do with two sincere but incompetent judges? Nothing, of course. So I am convinced that salon work will continue to decline until we seek some guidance from artists.

### PSA International Portfolios

There are openings in the following PSA International Portfolios for Pictorial Division members who are interested in interchanging prints for comment and analysis with the leading photographers in foreign countries:

Anglo-American
Canadian-American
India-American
Australasian-American
Cuban-American
French-American
Swedish-American
South African-American
Brazilian-American
Belgian-American
Chinese-American
Netherlands-American
Dominican-American
International Medical Portfolios
Costa Rican-American
Carribbean-American
Mexican-American
International Control Process Portfolios

For information, write to the Director of PSA International Portfolios, Miss Jane J. Shaffer, 5466 Clemens, St. Louis, Missouri.

## *HIGHLIGHTS FROM*
# Portrait Portfolios

PAUL J. WOLFE, *Associate Editor*

In case you may have missed it there were a couple of paragraphs in our recent issue of *Portrait Pointers*, edited by Maurice H. Louis, that can bear repeating:

> There seems to be a difference of opinion as to whether members should place only their best print in portfolios or to insert those which obviously are in need of criticism. Irregardless of which kind is presented for criticism, the physical qualities of the portrait should be of salon level . . . the best the maker is able to produce. There are far too many hurried and/or sloppy portraits offered and this greatly prejudices the maker's chances of receiving unbiased appraisal from fellow members.
>
> Faulty technique may be excusable on the ground of inexperience but printing from a dirty negative or enlarger, without spotting the print, is not.

Readers not in our Portrait Portfolios are urged to get into our family. *Portrait Pointers*, our publication, is given each member without charge. Write Paul J. Wolfe for information.

Ed Perry, of Cleveland, commentator for No. 11 writes in the notebook: "I attempt to judge the maker's print by the standard he has reached and not in comparison with the other prints in the folio. Hence, a glaring fault for a more advanced worker perhaps would not be mentioned to a new worker. By so commenting I feel each worker will receive and retain knowledge most pertinent to him at his particular state of development."

Carl N. Sanchez, Jr. offers No. 3 members the following fine grain, splendid graduation developer:

| | |
|---|---|
| Metol | 65 grs. |
| Sodium Sulphite (Anhy) | 285 grs. |
| Water | 32 oz. |

Use with such films as Super Panchro Press in a tank, agitate once every minute. It will develop to a nice gamma in 14 minutes at 68°. The negative is well adapted for use in a condenser enlarger.

Sanchez also suggests the following formula for Selenium Toning:

| | |
|---|---|
| Water | 16 oz. |
| Sodium Sulphite (Anhy) | 2 oz. 177 grs. |
| Selenium Powder | 45 grs. |
| Ammonium Chloride | 3 oz. 27 grs. |

Bring water to a boil, add sulphite and when dissolved add the selenium. Boil lightly until selenium is dissolved (goes very slowly) and when cooled add ammonium chloride. Use 1 to 10. In this weak dilution, control is better. It can be used until inactive.

Allan Horvath, commentator for No. 1, writes:

Technique includes all the fine points of lighting, posing, exposing and developing the film and finally the quality of the finished print. To get this beg, borrow or steal an original portrait or a fine reproduction of one in a magazine and go to work. Experiment and record the data as you go along. Keep at it until you can come reasonably close to the selected example. When you have achieved soft graduations in the light and middle tone areas of the print and when the dark areas are still luminous with detail, then you have taken one of the quickest and surest ways to success in photography.

"In most instances," says Allan Horvath, "the head should not be facing in the same direction as the shoulders and the rest of the body." Allan gives this advice to one of the other No. 1 members:

In breaking the rule of placing a person's head in other than the conventional area of balance, as in the lower corner, other counterbalances or posing variations must be done to correct the unbalanced effect. In such a case the uptilt of head and eyes or the addition of some prop may be all that is required to restore the compositional balance.

Jack Archibald in his recent article for *Portrait Pointers* gives anonymous credit for the following verse:

Photographers are noble men who see much good in every face;
They ease the scar, erase the blight and yield an image full of grace.
On wall or table or piano, we pose for all our kith and kin,
Who do not see us as we are, but as, with luck, we might have been.

## The Recorded Lecture Program

DR. C. F. COCHRAN, *Associate Editor*

It gives us a great deal of pleasure to announce a new Assistant Director of the Recorded Lecture Program, William E. Salyards, who will occupy the newly created office of Chairman of Distribution for the recorded lectures.

Mr. Salyards is well fitted for the new job. He is Art Director of Croname Co. of Chicago. Photography is not only his hobby but plays a big part in his work. Photography and the photographic processes enter into the creation and production of his company's product, name plates. As Editor of the company's house organ, Croname News, he also assumes the role of official photographer for the publication. As a designer and artist his hobby interest lies in color and color printing as well as straight and controlled black and white.

Our new assistant has been interested in organizational photography to the extent that he organized and sparkplugged a company camera club in his plant. He is also involved in the organization of a new camera club in Highland Park where he has his suburban home.

The booking and distribution of the recorded lectures is a sizeable job in itself, as your director learned when the requests started pouring in after the first releases were announced. The response to our announcements has been very gratifying. Bill Salyards will relieve the director of much of the detail in the matter of booking and circulation and will assist in the creation of new programs. With his help your director will have more time to devote to the recording of new talks. This is a step in the growth of an activity which has already become a worthy addition to the many services of the PSA Pictorial Division.

The other members of the Recorded Lecture Committee are Frank Fenner, Jr., FPSA, and Fred W. Edwards.

One of the jobs of the new Chairman of Distribution will be to carry on correspondence regarding the recorded lectures. In the future all inquiries and requests for booking should be directed to: William E. Salyards, 417 McDaniels Avenue, Highland Park, Illinois.

### Recorded Lectures

The Recorded Lecture Program of the Pictorial Division offers the following PSA Talks for your club:

No. 1. An Analysis of Recognized Salon Prints by Ragnar Hedenvall, APSA.

No. 2. Commentary on Recognized Salon Prints by Morris Gurrie.

No. 3. Outdoor Photography by D. Ward Pease, FPSA.

No. 4. Still Life by Anne Pilger Dewey, Hon.PSA, APSA.

SPECIAL. Photography of the Nude by P. H. Oelman, FPSA. (Available only from P. H. Oelman, FPSA, 2505 Moorman Ave., Cincinnati 6, Ohio.)

For Nos. 1 to 4 order from William E. Salyards, 417 McDaniels Ave., Highland Park, Ill.

### *That Deposit*

When booking is complete for a lecture the club which has contracted for the lecture has $25.00 on deposit. The difference between the deposit and the charges is normally refunded upon safe return of the tape and the slides. The question has come up about a second deposit for a second program when it comes within a comparatively short time, for example, when the two programs fall about a month apart.

In the interest of convenience a plan has been worked out. Instead of returning the deposit upon return of the first lecture, payment for the first one may be made and the deposit is then applied on the second program. If desired the same procedure could be duplicated on the third program with payment only being made for number two. Sounds complex, I know, but it is really simpler than refunding the difference and requiring a new deposit.

This may be a common practice, what with some clubs wanting to come in on the program with what amounts to a subscription.

## News of the Pictorial Division

MISS CHARLOTTE KESSLER, *Associate Editor*

### *Prize Analysis*

What happens when a print is sent to the Pictorial Division's Personalized Print Analysis? Let's follow the adventures of Cecil B. Wong's print, "Oriental Belle," on its two visits to the committee's qualified commentator.

The original print, "Yuk Laan," was sent to Director Elwood Armstrong, together with a contact print of the entire negative, and pertinent technical information, including the fact that he had taken this picture for possible exhibition use.

In analyzing each print, an analysis form is used which rates the print on 13 different points, including subject interest, compositional design, lighting, print quality, choice of paper, toning, spotting and finishing, and choice of title, as well as comments on the suitability of the picture for the purpose intended.

In analyzing "Yuk Laan," the commentator suggested that the spokes of the parasol be darkened, and that the picture be cropped at the right to take out the vase. The title came in for comment in that it was suggested that a more explanatory title in keeping with the subject matter be used. It was evaluated as good for club competition and with exhibition possibilities.

In posing hands, it was suggested that they be arranged so that the back of the hand is turned rather than being broad to the lens, as it may attract too much attention and look too large and out of proportion. Mr. Wong was complimented on the pleasing expression of the subject and the good skin tones.

Since the maker wanted to gain the greatest possible value from the Personalized Print Analysis made of his print, he remade it, following the commentator's suggestions. The revised print, "Oriental Belle," was resubmitted for analysis.

While the commentator stated that the spokes of the parasol should be still darker in this print also, he felt it was very greatly improved over the original. The hands and parasol are still somewhat too light and attract attention from the face where the

emphasis should be placed by having the highlights lighter here than on any other section of the picture.

In the opinion of the commentator an 11x14 or 14x17 of this picture should get recognition in club competitions and possibly in exhibitions. There is a noticeable improvement in this picture over the original print. Mr. Wong is advised lastly to keep up the work and let us see some more; to try this print out in competitions in a larger size and let us know the results.

Such is the history of "Oriental Belle." You, too, can take advantage of this Personalized Print Analysis Service by sending your prints to Mr. Armstrong.

## *Star Exhibitors*

New PSA Star Exhibitors and advances in rating are as follows:

*New 1-Star Exhibitors*
C. J. J. Schaepman, Zwolle, Netherlands
Clarence Homan, Chicago, Ill.
Thelma Tollenger, Pleasant Hill, Ohio
Commdr. Quentell Violett, U.S.N.

*Advanced from 1-Star to 2-Star*
Harold M. Biggs, Alton, Ill.

*Advanced from 2-Star to 3-Star*
John Springthorpe, Mt. Airy, N. C.

*New 3-Star Exhibitor*
H. T. Morris, APSA, Lancaster, England

Star Exhibitors are again reminded that enameled tabs in the four colors corresponding to their rank are available at $1.00 each. They can be obtained from Warren W. Lewis. Enclose $1.00 with order, or make check payable to the Photographic Society of America.

# Camera Club Activities

LYNNE PASCHALL, *Associate Editor*

"The proof of a pudding is in the eating thereof," so they say, and I recently had the opportunity to see at first-hand, how the Camera Club Print Circuits work.

The Troy CC, of which I am a member, received the pictures in Print Circuit 50-D. Almost every state has a "Troy" but the one where I live is in Ohio. The camera club is a small one, very small, and meets in the homes of the members. In some ways it is unique, and at some future time I'll have to tell you all about it and why it is so organized. Just now you are interested in how the Print Circuit was handled.

First of all, it arrived a long time ahead of the scheduled meeting, and it was promptly turned over to the print director who had ample time to study the prints, read the comments, and arrange his own presentation. In this instance he saw fit to follow the same procedure that is observed in our regular meetings.

The original "Yuk Laan," above. Right —"Oriental Belle," the revised print by C. B. Wong.

Instead of the familiar viewing box, this club uses an easel and a single flood light that is placed in front and a little below the picture. The outfit is easily carried from place to place and answers the purpose very well.

Each print was displayed on the easel in the order listed in the book, and after some general discussion, the appraisal of the commentator was read, after which the discussion was opened again. The commentator for this circuit was Dr. William F. Small, APSA, and his criticisms were generous and constructive.

As to the prints, they were good, but not so good as to be discouraging. Someone said, "Why, they average up about like ours." Perhaps they were better, but if the member thought he could beat them and was inspired to try, then the program was worth while. Looking critically at the work of others is an important part of our own education. When we can size up a stranger's print fairly, we are in a good position to see and correct the faults in our own work.

The secretary took notes while the discussion was going on, and that made it possible to fill in the comment sheets quickly. Next day, the box of prints was on its way to the Copper Country Camera Club, in Houghton, Michigan.

Mr. Hutchinson reports that another Print Circuit is on the road now. Number 50-E will visit the following clubs.

Newburgh Camera Club, Newburgh, N. Y.
Charlotte Photographic Society, Charlotte, N. C.
Tallahassee Camera Club, Tallahassee, Fla.
Naval Research Lab. Cam. Club, Washington, D. C.
Orange Camera Club, East Orange, N. J.
Elkhart Camera Club, Elkhart, Ind.
Aurora YMCA Camera Club, Aurora, Ill.
Duluth Camera Club, Duluth, Minn.

The commentator for this group is Mr. Edward F. Raynolds, APSA, of Central Valley, N. Y.

If your club is interested in taking part in an activity like this, we suggest that you write to William R. Hutchinson, who will promptly supply an information sheet and help you get started in a circuit.

## *The Price of a Print*

(As reported by Dr. William F. Small, APSA, Newburgh, New York.)

Seems as though Luther Miller, a member of the Newburgh (N. Y.) Camera Club, while driving to and from work, was greatly intrigued by an old abandoned church and thought that with a dramatic sky the same might make an entry for print night.

But like all good ideas there was one bad feature. Brush had grown up in front of the old church so that you could not get a shot because of the busy foreground. What did Luther do? Sure he did—sent a man with a bulldozer up to clear away the messy foreground. That done he would wait till light and sky were right—then—Print of the Month.

Came the day. A big blue bowl of sky filled with dramatic clouds! Quick the camera and to the scene! A shot? Of course not. There on Luther's church—a gang of men busy dismantling the building. The spire and roof gone. The shot gone. No print of the month for Luther this time.

Such is the luck of the plodding pictorialist. Such are the woes of the amateur photographer.

## *Coming Salons Agreeing to Follow PSA Recommendations*

NOTE: M—monochrome prints, C—color prints, T—color transparencies, SS—stereo slides, L—monochrome, slides, A—architectural prints, S—scientific or nature prints. Entry fee is $1.00 in each class unless otherwise specified. Recognition: The monochrome portions of salons listed have Pictorial Division approval. Check salon list of appropriate Division for recognition of other sections.

*Rochester* (M,T,S, Documentary) Exhibited Mar. 2–Apr. 1 at Memorial Art Gallery.
*Philadelphia* (M,T) Exhibited Mar. 3–25 at Free Library.
*Montreal* (M) Exhibited Mar. 9–28 at Museum of Fine Arts.
*Pittsburgh* (M,T) Exhibited Mar. 16–Apr. 15 at Carnegie Art Galleries.
*Worcestershire*, England (M,T) Exhibited Mar. 17–Apr. 7 at City Art Gallery.
*Port Colborne*, Canada (M) Exhibited Mar. 18–31 at the club.
*Reading*, Pa. (M,T) Exhibited Mar. 25–Apr. 22 at Public Museum and Art Gallery.
*Seattle* (M) Exhibited Apr. 4–May 6- at Art Museum.
*Boston* (M) Closes Mar. 25. Exhibited April 22–29 at the club. Data: Miss Selma Koehler, 122 St. Stephen St., Suite 14, Boston 15, Mass.
*Newport News* (M) Closes Mar. 31. Exhibited during April at Mariners Museum. Data: T. P. Holt, 1016 Ferguson Ave., Newport News, Va.

*Louisville* (M,T) Closes Mar. 31. Exhibited April 28–May 20 at J. B. Speed Art Museum. Data: Ernest T. Humphrey, 4722 Buckley Avenue, Louisville 8, Ky.

*Baltimore* (M,C) Closes Mar. 31. Exhibited Apr. 17–May 7 at Enoch Pratt Free Library. Data: Vernon N. Kisling, 2527 Creighton Ave., Baltimore 14, Md.

*Portland* (M) Closes Apr. 4. Exhibited Apr. 15 to May 15 at L. D. M. Sweat Memorial Art Museum. Data: Bradford Brown, 111 High St., Portland 3, Maine.

*Toronto* (M) Closes Apr. 10. Exhibited Apr. 30–May 12 at Camera Club. Data: Rex Frost, Toronto Camera Club, 2 Gould St., Toronto, Ont., Canada.

*Hartford* (M,C,T) T closes July 10; M,C on July 17. Exhibited T Aug. 1–18; M and C Aug. 1–31 at Wadsworth Atheneum in Hartford. T also exhibited in nearby towns. Data: Raymond J. Le Blanc, 234 So. Quaker Lane, West Hartford, Conn.

### *Other Overseas Salons*

*Charleroi* (M) Exhibited Apr. 1–15 at la Salle de la Bourse. Data: M. R. Populaire, 18 rue J. Destree, Charleroi, Belgium.

*Ipswich* (M,S,C,T) Exhibited Mar. 26–Apr. 7 at Art Gallery. Data: W. T. Nash, 44 Corder Road, Ipswich, Suffolk, England.

*Johannesburg* (M) Exhibited during May at Port Elizabeth, Durban and Pietermaritz. Data: Peter Marples, P. O. Box 7024, Johannesburg, So. Africa.

*Barrow-in-Furness* (M,S,L,T) Closes Apr. 7. Exhibited May 12–19 in Town Hall. Data: H. McMaster, 89 Yarlside Road, Barrow-in-Furness, Lancashire, England.

*Birkenhead* (M,C,T,L) Closes April 11. Exhibited Apr. 30–May 5 at Shaftenbury Boys' Club. Data: F. L. B. Revis, 1 Elm Rd., Prenton, Birkenhead, Cheshire, England.

*Barcelona* (M,C) Closes Apr. 15. Exhibited month of June at the club. Data: Secretario Agrufacion Fotografica de Cataluna, Duque de la Victoria 114, pral, Barcelona, Spain.

*Cologne* (M) Exhibited Apr. 20–29 in Exhibition Halls of Cologne. Data: Photokina 1951, Messeune Ausstellungs-Geo. m. b. H. Koln, Cologne-Deutz, Germany.

## psa

GEORGE F. JOHNSON, APSA
Forestry Building, State College, Penna.

### *That "Skylight" Filter*

Although quite some time has passed since the writer recommended the use of the new Kodak Skylight Filter for *all* outdoor exposures on any Eastman or Ansco daylight type color film, hardly a week passes without our receiving several letters commenting favorably on the use of this filter. No other technical advice given in this column has received such unanimous praise.

As it will be of interest we want to quote from the Eastman Kodak Company's new data book, "Color Photography Outdoors," a part of their new "Kodak Color Handbook," which explains why this "Skylight" filter gives very greatly improved performance when compared with older haze and ultraviolet filters. We quote:

Experience has shown that a filter which absorbs only ultraviolet radiation produces little effect on the film. A filter which absorbs only blue light in addition to the ultraviolet radiation generally produces a greenish cast over the distant haze and in areas of the picture illuminated by blue skylight. Actually the light from the sky consists of all colors, with considerable blue light and some green predominating. The Kodak Skylight Filter is designed to absorb ultraviolet, blue and a small proportion of green.

If you have not as yet used the Kodak Skylight Filter, by all means do so. Do not allow your dealer to substitute. An ordinary haze or ultraviolet filter is not the same and will not produce the same results.—KARL A. BAUMGAERTEL, APSA.

### *El Camino Field Trips*

Since they were first organized, the field trip program of El Camino Real Color Pictorialists of Los Angeles has been one of their most important and popular activities. It is not uncommon for them to have forty to fifty on these trips which have ranged from San Diego to San Francisco. They include one-day trips to some nearby point of interest, two-day camping trips to the desert, three-day trips to Yosemite National Park and Sequoia, and four-day trips to Death Valley and San Francisco.

A Field Trip Committee is appointed the first of each year. They draw up a tentative schedule for the entire year. A leader and sometimes an assistant leader is appointed for each trip. An effort is made to have each trip led by someone who is very familiar with the territory into which they are going. When this is not possible, scouting trips may be made two or three weeks ahead of the regular trip so that many of the best places for pictures will be known and the best time of day to be at each spot.

Some trips are to resort areas like Yosemite National Park where accommodations are almost impossible to get on short notice. Reservations are made by the trip leader . . . sometimes as much as six or eight months in advance. If it is to be a camping trip, the leader will select a campsite which is close to water and other facilities. Some places have stoves where cooking may be done, many use small gas stoves, while others use open fires. Sleeping bags are used by the majority on these trips but a few have their cars fixed so that beds may be made in them. Everyone usually gathers around the big campfire in the evening and as you can guess some phase of photography will probably be the main topic of conversation.

The leader or his assistant will handle the transportation. Those who can take passengers and those who want rides will contact him so that he can get them together. Riders help with the car expenses . . . 1¢ to 1½¢ per mile. A few definite meeting places and the time that the group will be there are arranged. This is important as it will give cars which become separated a place to meet the main party and also an opportunity for any who are unable to start with the rest a chance to catch up and be with the others for at least a part of the time.

One of the most important parts of the trips is the get-together which is held after everyone has his or her slides back from the processors. All slides are brought to be shown. The more advanced workers help the newer and less experienced by suggesting ways in which the pictures might have been improved. It is most interesting to see how different photographers handle the same subjects . . . one may use a normal lens and another a telephoto . . . one may take the picture from a very low angle, another may climb a tree to shoot it, while still another may make it from the side. Scarcely anyone comes away from one of these meetings without having picked up some valuable ideas which will help him to make better pictures at a future time.

It would be hard to estimate how many slides, made on El Camino field trips, have been accepted in major international color slide exhibitions . . . dozens and dozens that we know of. Successful field trips, like most everything else, don't just happen . . . they are the result of careful planning and preparation. Among the field trips on our 1950–1951 schedule are: a four-day San Francisco trip over the past Thanksgiving week-end; the three-day Yosemite National Park trip over New Year's, and the two-day Desert Flowers trip to Palm Springs and Indio, California, in March.—MERLE S. EWELL.

### *Who's Who Addition*

An addition for "Who's Who in Color Slide Photography 1949–1950" is G. T. Deeming, London, England, who had two slides accepted in two of the listed exhibitions.—BLANCHE KOLARIK.

### *Baumgaertel on Honors Committee*

Karl A. Baumgaertel, APSA, has been appointed a member of the PSA Honors Committee.

### *Editorial Board Created*

A Color Division Editorial Board has been created to assist with the editorial responsibilities of the Division. Getting helpful contributions for this column, doing the groundwork on special feature stories, and assisting with general editorial matters, will be the job of this Board.

The Board will consist of Merle S. Ewell, 1422 West 48th Street, Los Angeles, California, representing the West; H. G. Mitchell, 7455 North Greenview Avenue, Chicago 26,

QUIETUDE G. L. Bennett

Illinois, representing the mid-west; Paul J. Wolf, APSA, 354 Fort Washington Avenue, Hawthorne, New York, representing the East; and Karl A. Baumgaertel, APSA, 353 31st Avenue, San Francisco 21, California, the member-at-large. Suggestions regarding contributions of news material or feature articles for PSA JOURNAL on color photography can be sent to any of these representatives.

### *Individual Slide Contests*

The International Color Slide Competition for individuals has been a popular Color Division activity this season, according to reports from the supervisor, Charles B. McKee, 1435 38th Street, Sacramento, California. Five contests are arranged during the season and any Color Division member can enter four slides in each without entry fee. Non-members pay $1.00 fee. A total of 294 slides from 74 entrants were judged in the first contest, and 303 slides from 76 makers in the second. Medals and ribbons are awarded to the makers of the top slides (usually about 35) in each contest. The contests are scheduled for September, November, January, March and May.

### *Membership Slide*

The price of the Color Division membership slide has been reduced from 25 cents to 15 cents. It may be used by CD members in connection with slide presentations. To obtain one of these slides, send 15 cents in coin and return postage to Dennis W. Pett, 1415 E. 3rd St., Apt. W. 326, Bloomington, Indiana.

### *Color Stereo Photography*

For thirteen years I have produced a color slide show each year for my friends and business groups. I have toyed with color movies but prefer slides. Suddenly last summer I saw some stereo slides projected, and found that fair-sized groups could be satisfied. I bought a camera, ordered a projector, and was off.

The instructions were quite detailed about the mechanics of the camera and its operation. However, there was no data on what kinds of subjects made the best pictures, nor any other hints to help the beginner. I will pass over my search and experiments of the next few months and just pass on some hints which may be helpful.

INVITATION T. J. Newett

You need a subject with a foreground object.

For close-ups, have a background near and in focus.

Don't trust the range-finder. Of utmost importance is the depth of field or focus scale.

It is important that all principal material be in focus.

Distant pictures without a near-foreground object are flat and do not make good stereos.

Using a 100 foot path in my garden as a test, with the nearest object 10 feet from the camera, the rest was good. However, the best stereo effect seemed to be in the zone 10 to 50 feet.

You will rarely set the camera at infinity.

Hold the camera level, end to end, and steady. You can, of course, point it up or down.

If you mount your own stereos, be sure to get the films straight and the tops even.

Some pictures will look good in the viewer, but projection on a larger scale will show up flaws.

Projection can be smooth and pleasant, or a terrible headache to you and your audience.

Avoid unnecessary focussing.

For best projection, slides should be glass mounted. I use cloth binding tape, as it is easier to remove; also it doesn't skid as much.

Slides should be sorted in two piles: regular and close-ups. By doing this, I was able to run through 150 slides with only one focussing adjustment. This adjustment could even be made during intermission.

Give at least twice as much time to your view of the stereo as you would to a regular slide, so that the eyes can adapt to it without strain.

If you have ever projected stereos at random you will know what a strain it is to watch the slides during adjustments. Also, be sure your projector is steady, and caution the audience to keep their heads straight to see best through the polaroid spectacles.

I am quite serious in seeking reliable information. I hope PSA JOURNAL will run future articles amplifying these points and bringing out other experiences which may be helpful.—CHARLES A. HOWE

FISHING IN THE MOAT Elbridge G. Newhall, APSA

### *Coming Color Exhibitions*

*Louisville*, Apr. 13–18, deadline Mar. 31. Four slides, $1. Forms from Catherine Wiley, 2082 Douglas Blvd., Louisville 8, Ky.

*New York*, deadline Apr. 18. Four slides, $1 Forms from Dr. R. B. Pomeroy, 745 Fifth Av., New York 22, N. Y.

*Halifax*, May 28–June 1, deadline May 1. Four slides, $1 (include exchange on checks). Forms from W. Roy Isnor, 217 Agricola St., Halifax, N. S., Canada.

*El Camino*, deadline May 12. Four slides, $1. Forms from Merle Ewell, 1422 W. 48th St., Los Angeles, Calif.

## psa Camera Club

H. J. JOHNSON, FPSA
2134 Concord, Chicago 47, Ill.

Represented in the PSA International Club Print Competition this season are 80 of the leading clubs of U. S., Canada, and Costa Rica. They are separated into two divisions, "A" and "B," with 30 of them in the former class.

An important feature of the competition is that all prints are returned with criticisms

giving the chief reasons for the high or low scorings of the prints by the judges. It is for this reason that many clubs which do not anticipate becoming winners enter the competition. Win or lose, each club can benefit.

Judgings are handled by different clubs each contest. The first was managed by the Balco CC (Rochester), which was the first club to make a complete tape-slide story of the judging.

At first, the prints were all hung for preliminary study by the judges. Then the latter were seated at a table with the recorder microphone between them. Their discussions of each print (as it passed through the light box) were all recorded, and then keyed to slides made of the actual prints under discussion. Thus it is possible, with the resulting combination, to project on a screen every print in the contest and hear the judges discussing each one.

This tape-slide story would make an unusual type of program for your club and especially instructive because of the high quality of the prints and the analysis of each.

The tape and slides may be obtained from Phil Maples, (IR Dept., Bausch & Lomb Optical Co., Rochester, N. Y.) who handled the judging. The cost is low, only sufficient to cover the cost of material. Write to him for details as to scheduling, etc.

In illustration No. 1 (made by Ralph Dakin), Marty Kresge, Phil Maples, and Martha Tarplee are putting identification on prints after unpacking. In illustration No. 2 (made by Art Brown), judges Underwood, Young, and Wheeler are seated around the recorder microphone. In illustration No. 3 (by Dick Kraft), the packing crew, Pete Matronzano, Ralph Dakin, Doug Tait, Ralph Blier, and Ken Stiefel, have finished and the prints are on their way back to the clubs.

The winning clubs in that contest were Baltimore and Charlotte. Individual winners were Jack Stolp (Charlotte), G. Leonard Bennett (Green Briar), A. Aubrey Bodine (Baltimore), and J. J. Sipes (Detroit Guild).

Illustration Number 3.

In the second contest, handled by the Green Briar club (Chicago), the winning clubs were Channel City (Santa Barbara) and Central Calif. Council. Individual winners were G. Leonard Bennett (Green Briar), Bob Wilkins (Central Calif.), Thomas Newett (Green Briar) and Elbridge Newhall (Channel City).

Cumulative scores of the top half of the clubs in each class were as follows:

*Class A*

| | *points* |
|---|---|
| Baltimore | 149 |
| Kodak | 148 |
| Green Briar | 141 |
| Detroit Guild | 138 |
| Boston | 138 |
| Channel City | 127 |
| Detroit Silhouette | 123 |
| Lawson (Chicago) | 121 |
| Fort Dearborn (Chicago) | 121 |
| Oakland | 120 |
| Elkhart (Ind.) | 119 |
| Germantown (Phil.) | 119 |
| Pitts. Acad. of Science | 116 |
| San Fran. Photo Soc. | 115 |

*Class B*

| | |
|---|---|
| Central Calif. Coun. | 114 |
| Blackhawk (Iowa) | 104 |
| Santa Maria (Calif.) | 103 |
| Costa Rica | 102 |
| Charlotte | 102 |
| San Bernardino Lens and Shutter | 102 |
| San Luis Obispo | 98 |
| Memphis | 97 |
| Balco | 96 |
| North Shore (Mass.) | 96 |
| Bartlesville (Okla.) | 96 |
| Orleans | 94 |
| Berkeley (Calif.) | 93 |
| f/8 Guild (Milwaukee) | 92 |
| Shorewood (Milwaukee) | 92 |
| Spokane | 88 |
| Motor City (Detroit) | 88 |
| Owego (N. Y.) | 87 |
| Ft. Steuben (Ohio) | 87 |
| Phoenix | 87 |
| Sierra (Sacramento) | 80 |
| Tucson | 80 |
| Taft (Calif.) | 79 |
| Flathead (Mont.) | 78 |

At the time of this writing, scores for the February contest, handled by Channel City CC (Santa Barbara, Calif.) are not available.

Channel City's winning of the December

Illustration Number 1.

Illustration Number 2.

contest was unusual in that at the same time they were winning first place, Class A, in the International Club Slide Competition. This club will have a key place in the West Coast Regional Convention, of which club member Elbridge Newhall is general chairman.

### *The Camera Donates Prints*

Thanks from PSA clubs are due "The Camera" for its donation of prize winning prints from contests over a period of years.

These prints are being incorporated into the print set service of the Camera Clubs Committee as special sets which will be of particular interest to clubs whose members like to know how good prints are made.

The sets are announced, as available, in the Camera Clubs Bulletin, which all PSA clubs receive.

### *Vincennes—Vincennes*

Sometime ago we reported that the Vincennes (Ind.) CC was preparing a documentary set of prints of the home town to send to Vincennes, France, as a good will gesture. We learn that the set was completed and sent to France, and that the club received a letter from the mayor of Vincennes (where the prints are hung at the Art Center) praising the prints and the spirit that sent them.

# NEWS AND NOTES

## *PSA 1951 Convention*

Meet the Detroit Convention Executive Board:

*Lyall F. Cross, Detroit Convention Director.* Past President of the Photo Guild of Detroit, Vice President of the Detroit International Salon Society, Print Director of the Guild, Exhibitions and Competitions Chairman of the Greater Detroit Camera Club Council. An executive who knows his way around and gets things done. In private life deals in meats for hotels. Authority on where to get the best steak dinners in Detroit—and besides his wife is a good cook too. If you want anything in town he knows where to get it.

*Earle W. Brown, Detroit Program Director,* APSA, Past President of the Photo Guild of Detroit. Last year handled the PSA lecture tours. Familiar with program talent all over the U. S. He's an insurance sales manager and like all smart executives gets someone else to do the work while he puts his feet up on the desk and directs.

*J. Elwood Armstrong, Detroit Finance Director,* APSA, Past President of the Photo Guild of Detroit. Director of the Guild's National Activities. A real watch dog of the treasury. In private life a certified public accountant who is comptroller of Jam Handy Motion Picture Corp. His little black book is an encyclopaedia of information. He says, "You can't spend it until you can show me where the money is coming from."

*Walter J. Pietschmann, Detroit Secretarial Director.* Cornerstone Member of PSA. President of the Greater Detroit Camera Club Council. Treasurer of the Photo Guild. Five years secretary of the Detroit International Salon Society. Past President of the Chrysler Camera Club. When he isn't taking pictures he works for Chrysler Export Division-Central Planning, charting flow of production. You can't even whisper in a committee meeting but what he get it in the minutes. (And girls—he's a bachelor!)

*Laverne Bovair, Detroit Registrations Director.* President of the Photo Guild of Detroit. Table Tops expert. Gifted gadgeteer. Designer of our 1951 Convention Insignia used on our gummed labels. The hardest working guy you ever saw. Producer of machines and tools in private life. When you see his big smile at the Registration Desk you'll sure feel welcome.


INTERNATIONAL FLAVOR—The 1951 PSA Convention in Detroit is developing quite an international flavor. The gentleman in the center is from "South of the Border" although his name is John Steele and he resides in Toronto, Canada—for at Detroit, Canada is south of the United States. To add to the international touch, John is wearing a native costume brought back from Israel by Isadore Berger on his recent trip to Europe. On the left is Andy Anderson co-chairman of the hardworking Detroit Color Slide Group which has compiled the travel slide show with tape recording to give you a preview of your host city for 1951. The girl with the crank in her hand is Eva Briggs of the Covention Committee. The dog in John's lap is Amber Forever, Eva's little red cocker. Photo by Walter J. Pietschmann.

*Eva Briggs, Detroit Publicity Director.* Vice President of the Greater Detroit Camera Club Council. Five years secretary of the Detroit Portrait Photographer's Assn., on board of directors of the Photo Guild of Detroit, Life Member of the Photographers Association of Michigan. Cornerstone Member of the PSA. Master Photographer of the Photographers Assn. of America. Publicity Director for the Guild and the Council. The "conventionist going" person in Detroit. A nose for news—a head for organization. In private life a professional portrait photographer.

*Isadore Arnold Berger, APSA,* Past President of the Photo Guild of Detroit. Past President of the Greater Detroit Camera Club Council. Cornerstone Member of the PSA. In private life an attorney at law. Always fighting for the underdog. A diplomat of the first water. His job is to keep us out of the clutches of the law and smooth any ruffled feathers, advise on policies and procedure.

Since last April these folks have been getting up steam and working like mad so that you can have a good time at the 1951 Convention. In later issues of the JOURNAL you will meet other folks who are working with the Detroit Convention Executive Board. Remember *"IN 51 IT'S DETROIT FOR FUN!"*

### *Special Room for Portfolios*

One of the choice large rooms at the Book Cadillac Hotel—43½ feet long and 27 feet wide, has been earmarked for exclusive use of the portfolios, announces Earle Brown, Program Director of the Convention in Detroit. Here in the spacious, well lighted room there is ample space for excellent display of the various portfolios and plenty of room for portfolio members to chat and visit. Plan now to be in Detroit and meet your portfolio friends "in the flesh" October 10 to 13, 1951 at the Book Cadillac Hotel. Find out whether that guy in Podunk really looks like his picture he put in the portfolio—pin that fellow down from Main Street as to just how he got the results on that terrific snow scene—and ask the other camera bug—(you know who we mean)—where he gets all those lush nude models—or maybe we shouldn't mention that?

## *Prints from PSA Permanent Collection Shown at Kodak Exhibit*

Approximately 50 prints from the PSA Permanent Print Collection were placed on display at the Kodak Exhibit and Information Center, behind the Kodak Colorama in Grand Central Station, New York City, February 12 through March 9.

The display not only included the work of some of the most outstanding pictorial photographers in the world, but also represented the first time that a group of prints from the PSA's Permanent Collection has been publicly displayed. Many of the prints are world-famous examples of pictorial photography.

Included among the photographers whose work was shown was Leonard Missonne, the Belgian pictorialist, who was represented by a misty morning scene taken in early springtime. Joe Rosenthal's immortal photograph of Marines raising the flag atop Mt. Surabachi on Iwo Jima, and Frank Fraprie's long-famous "Tempest at Portofino" and "Warmth of the Winter Sun" were also shown.

Other well known prints exhibited ranged from an example of Ansel Adams' crisp and sparkling leaf studies to Pirie MacDonald's famous portrait of the poet, John Masefield, and F. J. Mortimer's thrilling picture of action at sea, "All's Well."

## *Joseph Mina Bing, Hon.FPSA*

Joseph Mina Bing, Hon.FPSA, died at his home, 10 West 33rd Street, New York, on December 9, 1950, in his 72nd year.

He was an Honorary Fellow of both the Royal Photographic Society and the Photographic Society of America, and the founder and President Emeritus of The Oval Table Society, as well as Commissioner to the U. S. A. for the Royal. For more than a quarter of a century, he was one of the most influential forces in amateur photography and in the photographic industry. It would take several pages to list all his services to PSA.

Mr. Bing was born in Vienna on November 1, 1879, the last of a long military, medical, and engineering family. He was graduated from the University of Vienna with the degree of Doctor of Engineering, and became an officer in the Second Corps Artillery, a guard regiment for the Emperor. As an engineer he was engaged in consulting railroad work in Austria, Argentina and several Central American countries, and was in charge of the tower construction in the building of the Hell Gate Bridge. His offices were in New York and New Orleans.

Keenly interested in photography, he was an official of The Camera Club of New York in its great period in the 20's. In 1925 he became the first importer of photographic exposure meters, in which field he was an outstanding expert and designer, and later was one of the largest importers of cameras and other equipment.

During World War II his manufacturing organization received two Army-Navy "E" Awards for their work in producing special tools and testing equipment for secret Navy devices and the design of the under-water camera.

In 1935 Mr. Bing organized The Oval Table Society and remained its guiding power until his retirement from its presidency last November, when he was named its President Emeritus.

Mr. Bing was a member of the Albert Pike Lodge of New Orleans and a Knight Commander of the Court of Honor of the Supreme Council of the Southern Jurisdiction of the Scottish Rite. He was also a member of the York Rite and of the Royal Order of Scotland.

Mr. Bing is survived by his widow, Mary Elizabeth Wilcox Bing.

## *Royal's Gift Received*

In announcing a gift of 16 photographs from the Ting Collection by the Royal Photographic Society to the PSA, Adolf Fassbender, Hon.FPSA, made the following remarks at the Annual Banquet in Baltimore last October:

"I am speaking in behalf of Mr. Bing, President of the Oval Table, who received a message from the Royal Photographic Society, and I think it is best that I read you the letter, which was addressed to the Secretary of the Photographic Society of America and written by Dudley Johnston. Perhaps many of you know Dudley Johnston. I would say definitely the dean of pictorial photography.

"He writes, 'Dear Sir: The Royal Photographic Society send hereby the fraternal greetings to the Photographic Society of America on the occasion of their annual conference in Baltimore and asks their acceptance for their permanent collection of sixteen photographs which have been acquired under the terms of the Steven H. Ting Foundation. The duplicates of these already form a part of the Royal Collection. It is hoped to supplement these by future purchases, usually annually. . . .

"'The object of the Ting Foundation is to secure representative examples both of current trends in pictorial photography, which will in the course of years record the progress of our photographic art.'"

The list of photographs from the Royal Photographic Society includes:

"A Dutch Lady," 1939—by Madam Yvonne

"Little Oriental," 1938—by Dr. Paul Truesdell

"Irish Landscape," 1939—by W. J. Rovery

"Design for Autumn," 1947—by Mrs. K. M. Parsons

"Bamburgh Castle," 1947—by L. Kershaw

"The Kitchen Maid," 1947—by T. F. Blumfield

"Geraldine," 1947—by Pamela Booth

"Vicki," 1947—by Mrs. G. V. Field

"The Abbott," 1947—by W. Harold House

"Immaculata," 1947—by Mrs. Olga Irish

"Council," 1949—by Mrs. Mildred Hatry

"Lino vaal Entierro"—by J. Ortiz Echague

"Portrait," 1949—by E. Johnson Taylor

"Calm before the Storm," 1949—by L. A. Leith

"Spectral Forest," 1949—by E. Broomer

"Landscape Fantasy," 1949—by George Halford

## *Exhibition Listing*

Forty-five open photographic exhibitions have been held since July 1, 1950 which have limited the entry to a maximum of four prints, have hung more than 125 prints, and have published catalogues up to February 1951. The following exhibitors have had 40 or more prints accepted in these exhibitions:

| *Name* | *Country* | *Exhibitions* | *Prints* |
|---|---|---|---|
| Frank J. Heller | USA | 43 | 110 |
| Harry L. Waddle | Canada | 37 | 97 |
| Doris Martha Weber | USA | 36 | 92 |
| Jack Wright | USA | 32 | 84 |
| Eleanor Parke Custis | USA | 28 | 74 |
| G. L. Weissenburger | USA | 32 | 73 |
| H. R. Thornton | England | 39 | 73 |
| Alfred Watson | USA | 36 | 69 |
| Eugenia Buxton | USA | 37 | 69 |
| T. L. Bronson | USA | 31 | 66 |
| Charles L. Wilson | USA | 25 | 64 |
| J. W. Galloway | Canada | 28 | 60 |
| Charles Manzer | USA | 29 | 55 |
| Boris Dobro | USA | 18 | 53 |
| H. W. Wagner | USA | 24 | 50 |
| O. E. Romig | USA | 20 | 49 |
| A. R. Casaco | Portugal | 27 | 49 |
| Erno Vadas | Hungary | 17 | 48 |
| Ortiz Echague | Spain | 17 | 48 |
| Jose Oiticica, Filho | Brazil | 22 | 48 |
| Francis Wu | Hongkong | 21 | 47 |
| Lowell Miller | USA | 18 | 46 |
| M. W. Tilden | USA | 23 | 44 |
| James A. McVie | Canada | 18 | 42 |
| Tibor Csorgeo | Hungary | 19 | 42 |
| Axel Bahnsen | USA | 16 | 41 |
| Karl Pollak | England | 12 | 40 |
| J. Benjamin | England | 18 | 40 |

Of the 45 exhibitions, 22 have been held in North America and 23 have been held at locations outside North America. The North American exhibitions have been: Memphis; Atlanta; Edmonton; Asheville; Calgary; Springfield, Ill.; Hartford; Sacramento; Vancouver; Puyallup; Oklahoma City; Milwaukee; PSA; Victoria; Chicago; Evansville; Pasadena; Arizona; St. Louis; Western Ontario; Columbus; and Springfield, Mass. The ten most prolific exhibitors in these exhibitions are:

| *Name* | *Country* | *Exhibitions* | *Prints* |
|---|---|---|---|
| Doris M. Weber | USA | 20 | 57 |
| Frank J. Heller | USA | 20 | 53 |
| Boris Dobro | USA | 17 | 52 |
| Jack Wright | USA | 17 | 49 |
| O. E. Romig | USA | 19 | 48 |
| Harry L. Waddle | Canada | 19 | 48 |
| Charles L. Wilson | USA | 18 | 46 |
| G. L. Weissenburger | USA | 19 | 42 |
| James A. McVie | Canada | 16 | 40 |
| Eugenia Buxton | USA | 19 | 37 |

The 23 exhibitions that have been held outside North America are: Port Talbot, South Shields, Midland, Falmouth, Denmark, Edinburgh, Antwerp, Royal, San Sebastian, Witwaterstrand, Sao Paulo, Focus, Bath, Cape of Good Hope, Melbourne, Windlesham, Luxembourg, Irish, Paris, Southampton, Ghent, Lincoln, and New Zealand. The ten most prolific exhibitors are:

| *Name* | *Country* | *Exhibitions* | *Prints* |
|---|---|---|---|
| Frank J. Heller | USA | 23 | 57 |
| Harry L. Waddle | Canada | 18 | 49 |

| Name | Country | Exhibitions | Prints |
|---|---|---|---|
| H. R. Thornton | England | 15 | 42 |
| Eleanor Parke Custis | USA | 17 | 42 |
| Karl Pollak | England | 10 | 35 |
| Francis Wu | Hongkong | 14 | 35 |
| Jack Wright | USA | 13 | 35 |
| Doris Martha Weber | USA | 16 | 35 |
| J. W. Galloway | Canada | 14 | 34 |
| A. R. Casaco | Portugal | 16 | 32 |
| Eugenia Buxton | USA | 15 | 32 |

## BOOK REVIEW

SOUTH AFRICAN PHOTOGEMS OF THE YEAR, 1951, edited by A. D. Benusan, APSA, Photo Publishing Co. of South Africa, P. O. Box 9612, Johannesburg, (American Photographic Publishing Co.), 60 pages, 7½x9¾, illustrated. (Available from PSA JOURNAL, postage prepaid.) $1.50.

Amateur photographers who like to know what goes on elsewhere will enjoy this review of South African photography, of South African salons, and of South African techniques, flavored with British and Dutch approaches to art and reproductions of photographs exhibited in the Witwatersrand and other South African Salons.

Helpful are brief articles based upon South African experience. J. W. McDonald, of Johannesburg, who hunts wild animals with a Leica and 90mm lens, advises against elephants or trusting lions, whereas giraffes pose willingly and simians are cooperative, if fed. E. Elliovson presents detailed advice on the photography of flowers, while C. V. Hougaard advocates taking pictures against the light, or at least, before breakfast.

Colin Frames, writing on "The Enemy of Art," can solace those who have suffered the barbs and arrows of outrageous judging. Ignorance, he insists, is the enemy, and that judge brands himself an ignoramus who fails to understand and to appreciate the motives and the methods of the makers.

## MESSAGE (From page 115)

### *Print of the Month*

Competitions have been conducted monthly since last spring, under the direction of Walter Allen, with six medals awarded each month. This competition is divided into beginners and advanced sections and is open to all members of the Society. The Board feels that this contest fills a need in the Society for encouragement of picture taking, but the response has not been what we had hoped. Possibly a little more publicity will put it over.

### *Journal*

The Publications Committee under the direction of Victor Scales and John Whiting, with the help of Fred Quellmalz, have succeeded in popularizing PSA JOURNAL in making it more worthwhile to the average member by increasing the proportion of how-to-do-it and other instructive articles. The response from the members to this change has been encouraging. Without doubt the division supplements have had a lot to do with increasing the value of the JOURNAL. For example, Ned Crossett commented as follows: "When I last wrote you I did not mention the fact that the last PSA JOURNAL came the first of the week. As you know, I have criticized the JOURNAL at times because of certain shortcomings. Because of this I thought I would let you know that this last issue was the best one which I have seen."

### *National Lecture Program*

P. H. Oelman and Earle Brown have done an outstanding job with the NLP. Tours by Pops Whitesell, Lorena Medbery and Ralph Gray have brought tangible PSA benefits to most of the states.

### *Tape Recording*

Since it is impossible for PSA to schedule tours for all of its top-notch speakers, we have turned to the use of tape-recorded lectures illustrated with slides to make more of our speakers available anywhere. The Color Division has pioneered in this activity and the Pictorial Division has also recently made available some excellent lectures. If you really want something constructive to take home from the Convention to your camera club, be sure to attend the session on tape-recorded lectures tomorrow morning.

### *Divisions*

Divisions have made considerable progress in providing more of their services free of charge, reducing the costs of others, and making them available to members in Canada and Hawaii.

### *Camera Clubs*

This Committee under H. J. Johnson has greatly increased the value of camera club membership by initiating new activities and by furnishing instructional print sets.

### *Awards*

We've instituted the PSA Service Award for contributions to photography or to the Society to be given to members who would not necessarily qualify for one of the Society's honors, such as the Associateship. It is the purpose to recognize services immediately after they are performed. We hope to encourage further work for the Society. It is the hope that the Service Award will take some of the pressure off the Honors Committee. You representatives are in the best position to find worthy recipients of the medal, who might be overlooked. You should send your recommendations to George Blaha, Chairman of the Special Awards Committee.

### *Conventions*

Members tell us repeatedly that conventions are one of our most valuable assets. Since our membership is so widely distributed we need more regional conventions. The Conventions Committee under Mel Woodbury has scheduled three regional conventions within the period of a year: one held in Chicago last spring, one to be held in Rochester in March 1951 and another to be held in Santa Barbara, California in June. The Santa Barbara Convention will be the first PSA convention held west of the Rockies. This should be a real boost to PSA in California, where we have our second largest state membership.

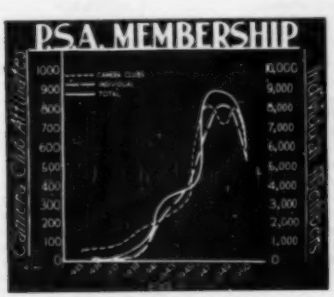
Responses from members and membership statistics are the only means we have to appraise the new program. Enthusiastic letters from members indicate that PSA is gaining in good will among its members.

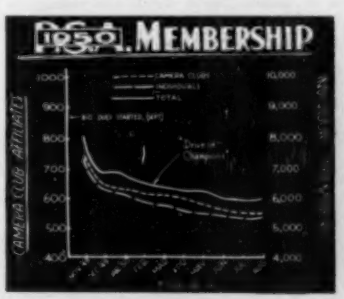
Bruce Cole, a member in Tucson, Arizona, writes in a letter received last week: "Would like to say that from where I sit it seems that PSA has done a whale of a good job this past year. I was afraid, when dues were boosted so high, that PSA might fold up, but it now looks as if it has acquired a new lease on life and is shifting into high."

It may be too soon to evaluate our program in terms of the effect it will eventually have on size of membership. This chart (Fig. 1) shows the membership trend from the beginning of the Society. You will note that we appear to be going downhill. The Board anticipated when it raised the dues to $10 that there would be a temporary drop in membership, but that this would be followed by an upturn provided that membership in the Society could be made more worthwhile. The second graph (Figure 2) covers this last year only, and shows that our forecast was correct and that we have leveled off at a membership slightly above our expectations. This leveling off of the membership may reflect three factors:

1. Intense effort put forth by District Representatives to hold our old members and to bring in new ones.
2. The new program of activities which began to take hold last spring and is still gaining momentum.

*(Concluded on page 154)*



# To Make Every Exposure Count... Know ALL Your Kodak Films

**ALL Kodak films are good. You know that already. But which Kodak films are best for the pictures you normally take? Which ones will give you the best combinations of basic qualities—adequate speed, color sensitivity, fineness of grain, resolving power, exposure latitude, and density scale for your printing requirements? Which Kodak films should you choose to meet special photographic situations? Which is next-choice when your favorite film for a given purpose is not available? What are the primary factors in selection?**

**You should know the answers to these questions—and here, to help you, is a two-part guide. First, a discussion of the general characteristics that appear in all films. Second, a chart showing specifically how these characteristics appear in each of the basic Kodak black-and-white films, as well as each film's normal field of use.**


**NEW—THE KODAK MASTER PHOTOGUIDE**

To get top quality from any film—monochrome or color—in any situation—use the new Kodak Master Photoguide.

Barely a handful, it's a quick-check library of photo data—*plus* every computing aid you need in the field. Basic exposure tips, special situations, film data, flash guide numbers. Fast-action dial calculators for daylight shots, flood, flash, field depth, and effective aperture. A set of four contrast viewing filters. Filter and Kodak Pola-Screen data. Data for close-ups, subjects in motion, field depth computing, and much more.

It's indispensable. The price, $1.75.

**1. SPEED.** This is a film's general or total sensitivity to light—usually daylight, or tungsten light such as photoflood or photoflash. Some films are extremely "fast"; others are "slow." Some have high sensitivity to photoflood light; others are "slow" to tungsten, even though fast in daylight. Extra speed is necessarily accompanied by some increase in graininess and some loss in resolving power. Therefore, medium-speed and slow films are better when big enlargements are planned, and top speed is not essential. High-speed films are better when you anticipate difficult lighting conditions, or fast action which will require maximum shutter speeds. For all-around use, a fine-grain film such as Kodak Plus-X (half the speed of Super-XX) is a judicious choice. Exposure indexes, daylight and tungsten, for the basic films are given in the chart below.

**2. COLOR SENSITIVITY.** This, basically, is a measure of a film's ability to reproduce a colorful subject in faithful black-and-white tone values. Kodak panchromatic films closely approximate ideal reproduction. Even without filters, their response is very near to normal visual sensitivity; and for critical scientific work, appropriate filters yield almost perfect tonal matching. All orthochromatic films reproduce blues too light, and reds too dark, but in many situations this departure from accuracy can be utilized to advantage; for example, many professional photographers will use nothing but ortho film for portraits of men. Infrared film, used with the proper filter to suppress its blue-light sensitivity, responds only to invisible infrared radiation.

**3. GRAININESS.** This determines a film's ability to yield pleasing enlargements,

| KODAK FILM | KODAK VERICHROME | KODAK PLUS-X |
|---|---|---|
| AVAILABLE IN | Rolls (all sizes) | Rolls 35mm. and Bantam |
| DAYLIGHT INDEX | 50 | 50 |
| TUNGSTEN INDEX | 25 | 40 |
| COLOR SENSITIVITY | Orthochromatic | Panchromatic |
| GRAININESS | Fine | Fine |
| RESOLVING POWER | 95 lines per mm. | 95 lines per mm. |
| EXPOSURE LATITUDE | Wide | Wide |
| FIELDS OF USE (Any of these films except Kodak Infrared can be used as an all-purpose film, but each excels in the field indicated.) | General outdoor use; night photography with photoflash. Reproduces flesh tones beautifully under artificial light. Effective for close-ups of men because Ortho materials tend to strengthen character lines. This is a top-quality film that more advanced amateur photographers should know. | An all-around film. High speed and fine grain provide good negatives under adverse light conditions. Low graininess and high resolving power allow big enlargements without grain. Its "Pan" sensitivity smooths out skin texture and contours, for good close-ups of women. Extra speed and color sensitivity make it ideal for most outdoor shots too. |

without a coarse "sandpaper" texture. Grain varies with speed; and the fineness of grain in even the most rapid Kodak films is a tribute to modern emulsion research. Plus-X is the all-around choice for good exposure speed and excellent enlargements from small negatives. Kodak Super-XX and Super Panchro-Press, Type B, are correct choices where higher speed is essential, and extreme enlargement is not contemplated. In all cases, correct development in a suitable developer is essential if the inherent fine grain of any film is to be preserved. Incorrect developers, forced development, or varying temperatures during development, will coarsen film grain. So will gross overexposure and underexposure, for these compel the use of "hard" papers that emphasize the "grain pattern."

**4. RESOLVING POWER.** This is a measure of a film's ability to record fine detail. It is commonly stated as the number of lines per millimeter that can be photographed and distinguished clearly in a test negative, exposed in a special camera to a test object with a 30-to-1 brightness range. In practical operation, resolution of detail is limited by many factors, including exposure; either underexposure or overexposure reduces detail. Resolving power is high in all the films listed, and is more than ample to cover all requirements of pictorial detail; it ranges from 80 lines for Super Panchro-Press, Type B, up to 100 lines for Panatomic-X. Obviously, this is not a primary factor in choosing between Kodak films.

**5. EXPOSURE LATITUDE.** This is a measure of the film's ability to yield satisfactory negatives when the exposure is more or less than that recommended for a given set of conditions. All the Kodak films listed here have ample latitude to take care of reasonable errors in computing exposure, as well as normal camera shutter variations resulting from age, wear, and temperature. However, even though high latitude is built into these films, you should remember that the recommended exposures are computed for the ideal portion of the film's tone-reproduction curve.

Subjects with very deep shadows and very brilliant highlights place special demands on film latitude. Kodak films will reproduce such subjects in full tonal range, *and this full-scale reproduction of high-contrast subjects is an important index of Kodak film quality.* As a practical matter, when prints of top quality are to be made on paper, the density scale of the negative should match the exposure scale of the print paper (which is fixed and unalterable). Such matching is achieved through subject selection and correct lighting; where these cannot be controlled, the procedure is to select paper whose exposure scale (as indicated by numerical grade or "hard" or "soft" rating) most nearly matches the negative's density scale. The happy combination of wide exposure latitude and long undistorted tonal scale makes Kodak films ideal for the production of consistently fine work.

**6. CONTRAST.** An essential trait is the film's ability to produce negatives with a tonal range, light to dark, which will yield good prints. All the films here listed are designed to produce, with normal exposure of a normal-contrast subject and normal development in a recommended developer, negatives which will print properly on a "normal" paper grade.

The emulsions are also designed to permit reasonable control in development, when it may be necessary to reduce or increase the density scale so that it teams better with a particular enlarger or printer, or to adjust the scale to a particular paper, or achieve a specific density range in color-separation work. Such selective control is of course usually feasible only with sheet or pack films; and, if it is carried to excess, tonal relationships necessarily suffer. However, this susceptibility to development control is a valuable feature of Kodak films, even if you rarely utilize it.

There are other film characteristics—but these are the basic six for film selection. And here, clearly charted, you see how they are combined in six famous Kodak films. In this chart, there is a combination to fit any field of picture taking that interests you, any problem you are likely to meet in that field, and any type of camera (roll, sheet, or miniature) that you prefer. Since each picture is a chain of relationships, from exposure through development and through the enlarger to the final print, it is wise to choose one basic film and *master* its use—learn its behavior so thoroughly that you can derive all the quality Kodak puts into it, learn how it responds to correct processing, learn which papers respond most happily to its negatives. Then you can readily adapt to the other films when need arises—and you should be familiar with them all.

| KODAK PANATOMIC-X | KODAK SUPER-XX | KODAK INFRARED | KODAK SUPER PANCHRO-PRESS, TYPE B | KODAK FILM |
|---|---|---|---|---|
| Sheet Film | Rolls and Film Packs 35mm. and Bantam Sheet Film (all sizes) | 35mm. Sheet Film (all sizes) | Sheet Film | AVAILABLE IN |
| 32 | 100 | (See footnote) | 125 | DAYLIGHT INDEX |
| 25 | 80 | 8 | 100 | TUNGSTEN INDEX |
| Panchromatic | Panchromatic | Blue* and Infrared | Panchromatic | COLOR SENSITIVITY |
| Very Fine | Moderate | Moderate | Moderate | GRAININESS |
| 100 lines per mm. | 90 lines per mm. | 80 lines per mm. | 80 lines per mm. | RESOLVING POWER |
| Wide | Wide | Wide | Wide | EXPOSURE LATITUDE |
| Basic for use where top-quality high-ratio enlargements are planned, and high speed is not essential; for architectural shots when extreme detail is desired; good for copy work and negatives leading to photomurals and the like. | Combines high speed with complete color sensitivity. Fine for fast-action shots, indoors or out. Gives fully timed negatives under difficult light conditions. Also useful for portraiture, commercial, and illustrative work. Sheet film is ideal for color separation negatives. | *Use with red filter, such as Wratten No. 25A, to suppress blue sensitivity and atmospheric haze. Wonderful for distant landscapes and dramatic effects such as brilliant white clouds against dark skies. Excellent for architectural subjects. Average sunny-day exposure, distant scenes, 1/25 at f/8; nearby subjects, 1/10 at f/6.3. | Ideal for press, portrait, and commercial photography with daylight, tungsten, fluorescent, or Kodatron illumination. Its color balance is especially good for photoflash close-ups of people. | FIELDS OF USE (Any of these films except Kodak Infrared can be used as an all-purpose film, but each excels in the field indicated.) |

Kodak

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

## PSA TRADING POST

*Open to individual members, free of charge. Limit 25 words each. Copy closes the tenth of the second preceding month before publication.*

*For Sale*—3—20x24" new enameled developing trays, 1—20x28" screw top print flattening press, 1—photostat machine and drier, 1—2¼x3¼" fine German camera. A. I. Rankin, 3509 Powhatan Ave., Baltimore 16, Md.

*For Sale*—Newman & Guardia "Sibyl" 2¼x3¼", Ross Xprss f/4.5 lens, needle sharp, G.G. Back, F.P. adapter, 12 double plateholders, case, $95. Chester Kohn, Oak Lane Manor, Melrose Park, Penna.

*Wanted*—Set of Morse sheet film tanks up to 5"x7". J. Newman, Saanichton, B. C., Canada.

3. The "Drive of Champions" drawn up by John Hogan. This Drive has brought in approximately 726 new members since April 15, 1950.

I have just told you that this administration has had as one of its objectives to make membership more valuable. Another goal for the past year has been to pay for our Headquarters Building, and we have come a long way in accomplishing that goal. We have sold approximately 190 Cornerstone Memberships since the Convention last year. There is no reason why we cannot sell a total of 250 Cornerstone Memberships by next year's convention.

Now a word about next year:

It will be our purpose to polish up the new activities launched recently. We will add new programs if they appear desirable. You will have an opportunity during discussions on the first item on today's agenda to tell what new activities or services we can adopt to make membership more valuable.

We need to push the "Drive of Champions" for all we are worth. We promised ourselves that the Drive would double PSA membership by October 1951. Here's where you Representatives can help. Go out and get people started signing new members, start a campaign in your home town, state or district, go after new members yourself. The future of PSA hangs on the success of this Drive.

As you return to your districts to represent PSA, *remember that PSA is a fellowship, not an institution. It's not an organization from which to take, but rather one into which to give.* As illustration of how this operating principle can work to the advantage of all, let me read one last letter received last week from two members in Texas.

"Twice during the current year it has been our good fortune to enjoy an extended visit by Mr. Angel de Moya. As a result of these visits, greater interest in amateur photography has been evidenced and interest in the Photographic Society of America has been stimulated. We desire to extend to you and through you to the PSA, our grateful appreciation for the wonderful spirit of cooperation demonstrated by a first-rank PSAer during his stay with us.

"Mr. de Moya at all times seemed eager to extend his help to the amateur photographer. He gave freely of his time and knowledge with a remarkable spirit of cheerful cooperation, and with neither hope nor expectation of reward or personal gain. Frequently his efforts to extend help to the aspiring photographer was at some expense and considerable inconvenience to himself. In every instance his response to expressions of gratitude was a reminder that the aims of the PSA are to advance amateur photography. On numerous occasions he stated to us that as an AFSA it was his pleasure to give freely of his time, his knowledge, and even of his personal funds in order to advance amateur photography in keeping with the aims of the PSA."

This letter exemplifies the true PSA spirit. PSA needs more members who will make similar unselfish contributions.

In closing, let me re-emphasize that PSA has a bright future of which you are a part. Let's all cooperate to promote the Society in every possible way.

## NEW MEMBERS JANUARY 1951

| *New Member* | *Nominator* |
|---|---|
| Ackerman, C. W., Cleveland, Ohio, | R. Hakanson |
| Alvarez, Sr. Anibal, Caracas, Venezuela, | F. Delima |
| Balraj, G. M., Bhandara, M.P., India, | K. Banerji |
| Bowerman, Wendell, Rochester, N. Y. | W. Swann |
| Barnola, Luis A., Caracas, Venezuela, | F. Delima |
| Barrett, Paul E., Jamestown, N. Y. | Membership |
| Benford, Samuel M., Mt. Vernon, N. Y. | P. Wolf |
| Benson, James M., Pittsburgh, Pa. | O. Romig |
| Bigwood, K. V., Christchurch, N. Z., | F. Casbolt |
| Bos, Mrs. Mary, Eggertsville, N. Y. | H. Reich |
| Bruckenstein, L. J., Beaumont, Texas | V. Rhodes |
| Carlson, Raymond, Phoenix, Arizona | H. Brown |
| Ceska, John, Cleveland, Ohio | Membership |
| Chamberlain, Katherine, Detroit, Mich. | E. Brown |
| Chao, K. H., Bangkok, Thailand | Membership |
| Chatterji, Deb Kumar, Calcutta, India | K. Banerji |
| Conklin, D. R., Chicago, Ill. | Membership |
| Cooper, Suzanne T., Washington, D.C., | Membership |
| Coppard, Charles H., Rochester, N. Y. | C. Kinsley |
| Cowperthwait, Hart S., Wash., D.C., | B. Fahnestock |
| Croucher, Mrs. Mary, Taunton, Eng., | Membership |
| Cunliffe, Selina, Methuen, Mass. | P. Cass |
| Cunning, Virgil A., Corona, Calif. | B. Kolarik |
| Day, Winsor B., Springfield, Mass. | R. Born |
| DeLara, Hector, LaHabana, Cuba | A. DeMoya |
| DeLevil, F. J., Louisville, Ky. | E. Zanone |
| Derryshire, S. W., Esquimalt, Canada | J. McVie |
| Duncan, C. J., Newcastle, England | Membership |
| Durba, Miss Bertha, Bronx, N. Y. | C. Doir |
| Eaton, James C., Walworth, N. Y. | C. Coppard |
| Eskenazi, Isaac, Caracas, Venezuela | F. Delima |
| Faye, Ralph R., Cleveland, Ohio | J. Langlotz |
| Feuguas, Luis A., Caracas, Venezuela | F. Delima |
| Fenning, Marian M., Detroit, Mich. | J. Armstrong |
| Fillius, Milton F., Rochester, N. Y. | H. Smith |
| Flanagan, J. T., Anchorage, Alaska | G. Whitehead |
| Flournoy, Miss Doris, Chicago, Ill. | W. Parker |
| Forer, Bernard, Trenton, N. J. | L. Lehman |
| Franklin, Wm. D., San Francisco, Cal., | Membership |
| Friedman, H. G., Shreveport, La. | Membership |
| Galloway, J. W., Edmont, Canada | Membership |
| Ganeau, Will F., San Francisco, Cal., | J. Mengel |
| Garcia, Stephen, Belen, N. M. | Membership |
| Gaylard, Robert C., Hamilton, N. Z., | H. Larson |
| Jenkins, Philip, London, England, | F. Quellmalz |
| Gilbert, Edgardo, Orients, Cuba | F. Fequeredo |
| Goley, D. E., Scottsdale, Arizona | Membership |
| Greene, Ronald, Asheville, N. C. | M. Cipar |
| Grubb, Robert B., Philadelphia, Pa. | Membership |
| Gunczler, Nicolas, Caracas, Venezuela, | F. Delima |
| Hamilton, Suzanne, San Gabriel, Cal. | P. Cass |
| Hartley, William H., Troy, Ohio | A. Paschall |
| Holloway, James K., Albany, Cal. | P. Cass |
| Hurd, Edwin W., Detroit, Mich. | A. Norbury |
| Hutcheson, Gilbert, Richmond, Cal. | M. Horn |
| Hutton, J. L., Boulder, Colo. | Dr. L. Handly |
| Jacobs, Edward, San Francisco, Cal. | F. Farhone |
| Jasani, Devendra K., Gondia, India | K. Banerji |
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| Johnson, R. G., Minneapolis, Minn., | L. Hanson |
| Johnson, Otis W., Tyrone, Pa. | Membership |
| Johnson, Dr. Q. R. Jr., Louisiana, Mo., | Membership |
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| Keel, John H., Marshfield, Wis. | Membership |
| Kern, Dr. F. M., Philadelphia, Pa. | Membership |
| Kirkpatrick, W. A., Phoenix, Ariz. | R. Gray |
| Koehn, R. E., Cudahy, Wis. | Membership |
| Koehn, Reginald R., Exeter, Nebr. | Membership |
| Konkle, Janet, Grand Rapids, Mich. | B. Hulett |
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| Kroger, Robert, Kalispell, Mont. | F. Rademaker |
| Laird, Dr. Raymond L., Memphis, Tenn., | T. Gaines |
| Lappas, J. T., Pittsburgh, Pa. | Membership |
| Lawrence, Mrs. Kay, Falmouth, Mass., | Membership |

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|---|---|
| Lloyd, Raymond W., Quakertown, Pa., | G. Johnson |
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| Lynn, Herb, Hollis, L. I., N. Y. | I. Schlackman |
| MacDaniel, Dr. D. I., Connersv', Ind., | Membership |
| McDonald, G. G., Kinistino, Canada, | Membership |
| McMillen, Earl A., Shepherd, Tenn., | B. McMillen |
| Miller, Alton L., Boston, Mass. | F. Quellmalz |
| Miller, Lloyd D., Clarendon Hills, Ill., | F. Helm |
| Mueller, George A., San Antonio, Tex., | L. Handly |
| Nicholson, R. A., Signal Mt., Tenn., | H. Jackson |
| Niukkanen, Erkki, Hyryla, Finland, | F. Quellmalz |
| Nootbaar, Robert F., LaGrange, Ill., | Membership |
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| Packo, Robert, Toledo, Ohio | A. Bahnsen |
| Pane, Cal, Hazleton, Pa. | F. Moyer |
| Parande, M. G., Nagpur, India | K. Banerji |
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| Pollak, Walter G., New York, N. Y., | Membership |
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| Richter, Fred T., Chicago, Ill. | H. Johnson |
| Rindell, Robert M., Downers Grove, Ill. | G. Blaha |
| Sahai, H., Khagaria, India | Dr. G. Thomas |
| Sampat, Hamraj A., Nagpur, India | K. Banerji |
| Sanoja, Reinaldo L., Caracas, Venezuela, | F. Delima |
| Schaadt, James G., Wellesley Hills, Mass., | L. Ellis |
| Schochet, Paul, Glen Burnie, Md. | Membership |
| Schoonmaker, M. C. Jr., N.Y., N.Y., | W. Woodburn |
| Shah, B. K., Khaparkheda, India | K. Banerji |
| Shaw, Frank O., Gig Harbor, Wash., | Membership |
| Sherman, A., Saskatoon, Canada | Membership |
| Speedy, K. K., Hamilton, New Zealand, | H. Larson |
| Sperber, B. H., Brooklyn, N. Y. | Membership |
| Stauber, Harold, Bloomfield, N. J. | H. Sheldon |
| Stocke, James A., Rochester, Minn., | Membership |
| Sugarman, Benjamin, Chicago, Ill. | Membership |
| Sumner, William M., Lompoc, Calif., | Membership |
| Sutaria, Ramesh C.D., Nagpur, India, | K. Banerji |
| Sydney, Abbott, Milltown, N. J. | Membership |
| Sypulski, John L., Sacramento, Cal., | Membership |
| Thompson, George T., El Paso, Tex. | C. Perry |
| Thomsen, Petur, Reykjavik, Iceland, | Membership |
| Todd, Gordon Karl, Van Wert, Ohio, | R. McFerran |
| Torbert, Bernard L., Hector, Minn. | L. Hanson |
| Towers, George, Detroit, Mich. | Membership |
| Turner, J. W., Pleasant Ridge, Mich., | J. Armstrong |
| Underell, J. W. J., Montreal, Canada | W. Wood |
| Vichak, C. C., Bangkok, Thailand, | F. Quellmalz |
| Wait, A. H., Waban, Mass. | F. Quellmalz |
| White, Charles L., Cleveland, Ohio | Membership |
| Winbray, J. D., Oklahoma City, Okla., | G. Fiellin |
| Wood, Robert L., Springfield, N. J., | C. Treveiyan |
| Woodward, M. M., Lansing, Mich. | Membership |
| Zamindar, V. R., Chanda, India | K. Banerji |
| Zoubek, Frank W., St. Paul, Minn. | P. Cass |

### Camera Clubs

| *New Member* | *Nominator* |
|---|---|
| Hutchinson CC, Hutchinson, Minn. | Membership |
| Hudson Valley Color Slide Club, Newburgh, N. Y., | W. Hutchinson |
| Club Fotografico de Venezuela, Caracas, Venezuela, | F. Delima |
| Lens & Shutter Club, Chambersburg, Pa., | H. Johnson |
| Manteno State Hospital CC, Manteno, Ill., | Membership |
| Petaluma CC, Petaluma, Calif. | Membership |
| Shell CC, Martinez, Calif. | D. Finch |
| Tripod CC, Bristol, Conn. | Membership |
| F. 67 CC, Bremerton, Wash. | Membership |

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## "Really, the Camera is Great"

*says Gordon Kuster, Director of Photography, The Columbus Dispatch, Columbus, Ohio*

**Press photographers** and others who specialize in action photography find the Kalart's Luminous View Finder a revolutionary improvement. No tiresome squinting. You keep *both* eyes open — observe subject in *full life* size.

**Explorers and travelers** welcome the Kalart's light weight and compact design. Complete with built-in Range Finder, Focuspot, View Finder and Speed Flash, it weighs under 5 lbs.—measures less than 7 x 7 x 3 inches.

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**Wide angle or telephoto lenses** are easy to use with the Kalart Camera. Lifting one lever permits removal of lens board. Auxiliary lenses include 90 mm. wide angle — 8" or 10" telephoto in Rapax standard or "X" shutters.

*Free* — Illustrated Brochure on New Kalart II Camera, accessories and auxiliary wide angle and telephoto lens. Just send your name and address on post card to Dept. PJ 3 The Kalart Company, Inc. Plainville, Conn. Also please give name of photo dealer and make of camera now owned.

*Whatever the contrast of the negative . . .*

**chances are it will print beautifully on**

# Kodak Platino Paper

Whether your negative is flat, normal or contrasty, the variety of contrast grades available in Kodak Platino Paper makes possible quality prints every time. Less warm than Kodak Opal Paper, but warmer than Kodabromide, Platino is moderately fast, with a wealth of inherent modeling and brilliance. Moderate overexposure of Platino provides a slightly warmer tone; less exposure, a colder tone. And Platino's rich chocolate color, when treated in Kodak Brown Toner, is a plus factor that appeals to discriminating photographers everywhere. Your Kodak dealer stocks it.

**EASTMAN KODAK COMPANY,** Rochester 4, N.Y.

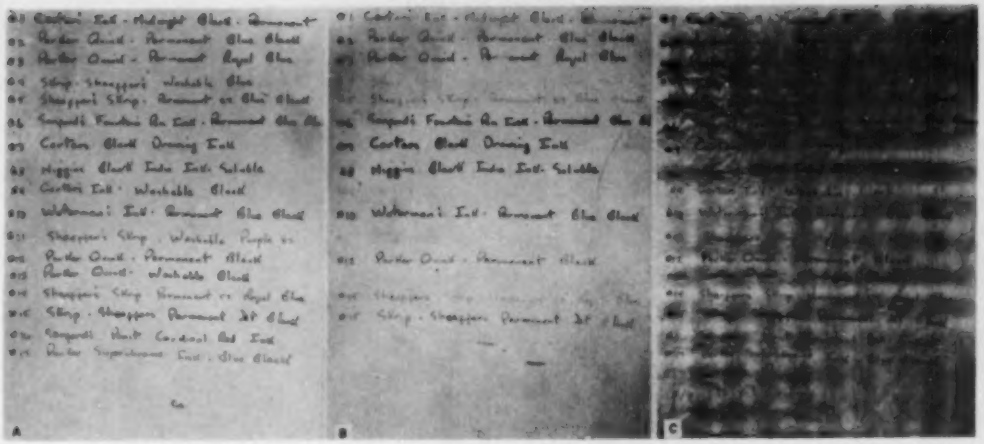
Kodak

psa
JOURNAL
SECTION b

# PHOTOGRAPHIC SCIENCE AND TECHNIQUE

*A quarterly technical supplement to PSA Journal*

SECOND 1951 ISSUE ☆ PUBLISHED WITH VOLUME 17, NUMBER 4 ☆ APRIL 1951



# INFRARED PHOTOGRAPHY

THE technical scope of the Document Examiner has been substantially increased through the development of infrared photography. Originally intended for use by physicists and astronomers, infrared-sensitive films proved to be superbly adapted for the examination of physical evidence. The selective penetrating properties of infrared radiations made it possible to detect, record, and demonstrate numerous evidentiary conditions. Also, its efficiency for many purposes resulted in the simplification or supplanting of established procedures.

Infrared photography has a wide range of applications and is especially effective with dark, transmissible or reflecting substances. Through the unique behaviour of this medium: (1) Similar appearing inks are differentiated and identified as to general type. (2) Various dark markings and substances are differentiated, lightened or filtered out. (3) Obliterating matter such as overwriting, colored printing, rubber stamp impressions, dirt, grease, etc., are filtered out allowing obscured details to be seen. (4) Dark backgrounds are filtered out. (5) Charred writing is deciphered; charred eradicated areas are detected. (6) Mechanical erasures and faint indentations or projections are deciphered. (7) Faint pencil writing and graphite smudges are made to appear more clearly. (8) Many forms of latent and obscure evidence (fingerprints, underpainting, etc.) are brought out.

### Technique Controls Results

The effectiveness of the infrared examination depends fundamentally upon sound technical procedure. Through

SECOND 1951 ISSUE — VOLUME 17B, NUMBER TWO — PUBLISHED WITH THE PSA JOURNAL FOR APRIL 1951



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Fig. 4. Various samples of writing inks photographed (A) on orthochromatic film, (B) on infrared film using a Wratten No. 87 filter. In (C) samples 18 and 19 have been added and the paper has been charred by burning. Note that "washable" inks have been altered by burning so that they are opaque to infrared.

## Part II Camera Technique

JOSEPH THOLL*

# *of* DOCUMENTS

the purposeful manipulation of copy and lighting, correct focusing of the invisible image, proper selection of filters and careful attention to exposing and developing, infrared photography can be made to yield positive results where, otherwise, there might be failure. Each of these factors forms an integral part of the evidential infrared photograph. Lighting, in a great measure, controls tonal separation, contrast, depth, and affects the sharpness of the image. Critical focus gives the accentuated qualities of sharpness and crispness so vital in forensic photographs. Correct filtering makes use of the most effective wave-length region and is important because infrared films are sensitive not only to invisible rays but to visible light as well. Exposure for the invisible infrared is determined by the unseen photochemical peculiarities of a subject. Processing may be curtailed or extended, to produce flat or contrasty results according to the contrast requirements of the subject. Each of these factors is separately discussed.

### Camera Equipment

Conventional equipment was used for making all of the illustrations. In this type of work it is the technique rather than fancy gadgets and costly apparatus which counts. Two cameras were utilized, a 4 x 5 Speed Graphic and an 8 x 10 view camera with a 5 x 7 reducing back. The film holders were a standard type whose slides bore five embossed dots (manufacturer's indication of infrared opacity). The lenses utilized were a 127 mm Ektar anastigmat, which is standard equipment on the 4 x 5 Graphic, and a 7 inch Taylor, Hobson and Cooke anastigmat (flat field). The tripod was a sturdy folding type with a tilting top for vertical photography.

### Studio Conditions

All extraneous light and reflections must be eliminated when copying with infrared else special lightings are nullified or lose much of their effectiveness. Directional and grazing lightings are considerably changed by a relatively small amount of diffused light. Stray reflections, uncontrolled daylight, and other superfluous sources of radiation may adversely affect a situation. Infrared copying is best done in a dark room with non-reflecting walls.

### Lighting

The lighting utilized depends on the nature of the evidence to be photographed. Textural and surface details require a lighting that emphasizes contrast and relief. In some cases both of these forms of lighting, the flat and contrasty, are combined for a characteristic effect.

*Diffused Illumination*

Diffused illumination which favors tonal gradations at the expense of contrast and texture is best suited for recording the photochemical action of the infrared. This lighting is used for: (1) the comparison and identification of

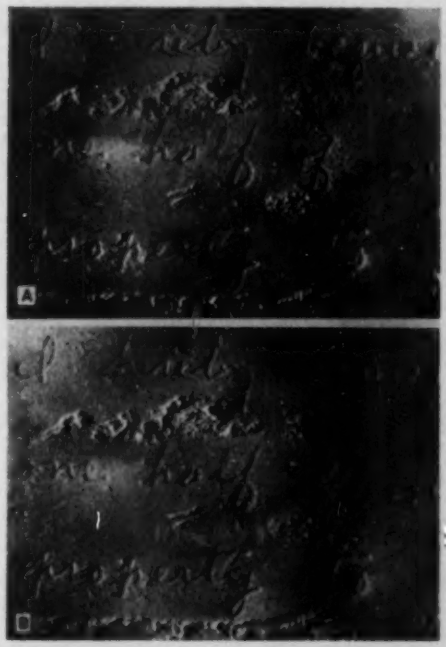


Fig. 1. Infrared photographs of pencil erasure lighted (A) by grazing rays projected from a condenser enlarger and (B) by a combination of grazing light and diffused light from a photoflood lamp at a 20-30 degree angle. Both negatives were developed 6 min. in D-61a.

* Examiner of Questioned Documents, 3260 Cedarbrook Road, Cleveland 18, Ohio. Received 12 February 1951. Part I, dealing with contact techniques in infrared photography of documents, appeared in the February 1951 issue.

inks; (2) filtering out and lightening dark or obliterating substances; (3) the decipherment of charred documents; (4) for maximum tonal separation (not contrast) between similar appearing substances.

Diffused cross-lighting gives maximum tonal separation with little or no textural relief whereas a single, diffused light source (45 degree) combines a fair amount of tonal and textural details. For example, cross lighting will minimize obliterating, distracting surface detail on charred paper to allow the charred writing to stand out. On the other hand the single diffused light source brings out, simultaneously, ink (tonal) and paper (textural) details; in paintings both pigment (tonal) and brush (textural) characteristics are revealed. A thorough examination may necessitate a series of photographs employing several lighting arrangements.

*Contrast Illumination*

As the illumination becomes more concentrated and focussed it tends to give more textural relief, sharpness, depth and contrast while allowing a lesser degree of tonal gradation. Employed as a grazing light it becomes highly delineative, bringing out surface details through brilliant highlights and hard thin shadows. The grazing light is particularly effective in conjunction with infrared because it gives a more pronounced tonal separation than is the case with visible rays. Grazing illumination and other forms of contrasty, textural lightings are well adapted for the decipherment of depressed mechanical erasures and indentations impressed from another sheet.

To secure an extremely concentrated and directional illumination use was made of a horizontal condensing lens enlarger as a light source. When projected parallel to the surface of the document the rays provided an excellent grazing light. Also when projected from an approximate 70 degree angle and focussed onto the plane of the document, there was produced an extremely sharp, concentrated illumination for general purposes. A lantern slide projector was also utilized as a source of grazing and focussed illumination.

Figure 1A was made with the grazing rays from a 250 Watt spot light lamp projected through a pair of condensers and an f/6.3 flat field lens. The grazing rays have sharply outlined the depressed pencil erasure and the torn paper fibres. In Fig. 1B both grazing and diffused (photoflood) lightings were combined, through separate exposures, to give a somewhat flatter though still legible result. The lighting used in Fig. 1A is best for emphasizing relief whereas the flatter combined lighting of Fig. 1B is better suited for both tonal and textural values. A single photoflood from a 20-30 degree angle will give similar, though less pronounced results (Fig. 8) than the combined lighting shown in Fig. 1B.

**Fig. 2. Ordinary and infrared photographs of a ledger sheet charred by fire. Exposure 1 min. at f/16. Diffused cross-lighting. Developed 4½ minutes in D-61a.**


**Fig. 3. Fire charred document photographed (A) on ordinary film, (B) using infrared sensitive film, and (C) on infrared film with a white blotter almost in line with the lens.**

## Focusing

Many forms of latent and obscure evidence can be clearly seen only when the infrared image has been in absolutely sharp focus on the film. Critical focus imparts to hard-to-see evidence qualities of clarity and incisiveness without which they tend to lose their value as forensic exhibits. Where factors such as tonal separation, relative transparency and opacity must be evaluated by a lay court, an almost exaggerated sharpness and crispness become indispensable requirements.

A simple system of focusing the infrared with an anastigmat lens has proven of practical value for the close-up photography of documents. A three or four power magnifier and a transparent area on the ground glass should be used as aids in focusing. The operations are as follows:

(1) Find the critical focus for unfiltered light with the lens opened to widest aperture and mark the camera position with a section of white card on the track. (Focusing from the back is generally more practicable).

(2) Screen the lens with a Wratten No. 25 filter. Move lights temporarily close to the camera (with caution) for a brighter ground glass image. Find the critical focus for the red light transmitted by the filter.

(3) From the position of the white card on the camera track observe the distance of compensating adjustment from *unfiltered to red filtered focus.*

(4) Now rack the camera for an IDENTICAL DISTANCE IN THE SAME DIRECTION as was used from unfiltered to red filtered focus to bring the infrared rays into focus. (If one-tenth of an inch was used for bringing the red rays into focus from the unfiltered position, rack the bellows for an additional one-tenth inch for the infrared).

(5) Reduce the lens aperture (to f/16 for example), return the lights to the desired position and make the exposure.

A camera equipped with a focusing lens-mount can be used. The corrective adjustment for the infrared can be gauged by the degree of turn of the front focusing screw. One can judge the effectiveness of this system of focusing the invisible infrared by observing Figures 1A and 1B.

Adjustments from the visual focus are not necessary with lenses that have been corrected for the infrared. The Kodak Process Ektar lenses are examples of copying lenses that are corrected for the infrared and near ultraviolet.

## Filters

In the course of examining various kinds of physical evidence it was found necessary to use filters transmitting wavelength regions from 590 $m\mu$ in the orange-red to 900 $m\mu$ in the infrared. Washable inks and many permanent writing inks show an increasing transmission to the infrared in direct ratio to the increase in wavelength. Washable inks that were completely transparent to the infrared in the 760 $m\mu$ region (Wratten No. 87) were relatively opaque to visible red light in the 590 $m\mu$ region (Wratten No. 25). See Figures 5A, 5B, 5C, and 5D.

Filters should be utilized for specific functions. Heavier filters of the Wratten Nos. 87 and 87c type are most effectual for the elimination or lightening of dark inks and obliterating matter, and for maximum tonal separation in charred documents. The comparatively lighter red filters such as Wratten Nos. 25, 29 and 70 are more practicable for erasures containing imbedded particles of transmissible ink, and generally for purposes where extreme filtering is not desirable.

**Fig. 6. Normal and infrared photograph of a receipt suspected of alteration. A Wratten No. 25 filter was used to filter out the red printing and red stamp impression. One photoflood, 5 seconds exposure at f/16, developed 5½ minutes in D-61a.**

## Exposure and Development

In visible light photography the exposure time is calculated from measurements obtained by use of meters that are sensitive to the visible rays. With infrared films the exposure is determined by the effect of the invisible infrared radiation on the film itself. This can only be ascertained experimentally. A dark surface like moderately charred paper which reflects infrared may take a comparatively short exposure while another shade, such as a pigment of equal visual density, with a high relative infrared absorption may require a considerably longer exposure to record detail. Then again, *well* charred documents will take an extended exposure while a smear of black washable ink needs a very short one. Where the exposure is in doubt trial exposures must be made to observe the action of the infrared.

The processing of the exposed infrared film depends on the amount of exposure given and the inherent contrast of the subject. Subjects of high inherent contrast require a curtailed development (75% normal) in a flat-working formula whereas subjects of low inherent contrast need full development in a strong-working formula. Several intermediate degrees of processing can be utilized to control the contrast.

## Applications

*Charred Documents*

The decipherment of charred documents by infrared photography is a possibility so long as there is some physical difference between charred paper and writing residue. Failure will be encountered where there is complete, over-all carbonization or insufficient residual writing traces. On the other hand failure may be due to use of the wrong filter, inadequate lighting, or insufficient exposure

The fact that charred paper is rendered as a light shade and charred writing as a dark one, indicates that the former more or less reflects infrared while the latter absorbs it (Fig. 2). This dual process of reflection and absorption results in a degree of contrast that is determined by three factors, namely, (1) the extent of charring of the paper, (2) the amount of ink residue, (3) the length of the exposure. The effects of these conditions was borne out by experiments which showed (Fig. 3) that charred paper, because of its reflective behaviour could be: (a) overexposed like any light surface; (b) made to reflect even reflected diffused illumination; (c) made more legible through increased exposure.

Moderately charred documents (dark brown) containing clear traces of writing or printing possess a high inherent contrast and need diffused lighting and medium (75%) development. As the inherent contrast decreases because of carbonization and fragmentary writing traces, the photographic contrast should be correspondingly increased by means of added exposure and prolonged development.

Eradicated areas on charred documents that have been subjected to chemical "ink removers" can sometimes be visually identified because of the deep black carbonization on both sides of the document. It was also observed that washable inks, which are ordinarily completely transparent to infrared, became quite opaque through charring (Fig. 4) as well as becoming insoluble in acid reagents.

Charred specimens, if not too fragile, can be made more pliable by immersion in a print softening solution like Flexogloss, or may be mounted in gelatin between glass.

## Examination of Inks

The utility of infrared for the examination of inks is based on the characteristic absorption or transmission of the radiation by inks of various chemical composition. Similarities or differences as well as general type are photographically indicated by a light, dark, or intermediate tone on the positive print. Figure 4 illustrates how a number of representative inks appear by visible and infrared photography; in 4C the sheet of specimen inks was charred for experimental purposes with evident results.

### *Wavelength Region Varies in Effects*

The infrared recording of inks varies in its effects according to the wavelength region transmitted by the filter. Permanent inks with a large percentage of highly transmissible provisional coloring, and the washable inks became progressively more transparent as the wavelength was increased; the former became relatively transparent and the latter completely transparent at 760 mμ. (See Fig. 5).

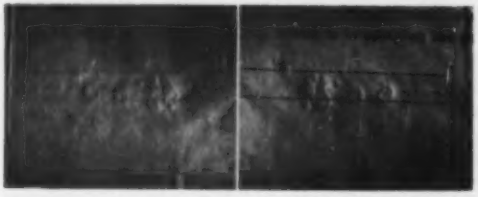

Fig. 8. Opposite sides of a mechanical erasure lighted by an obliquely placed photoflood lamp. Grazing rays would have obliterated some of the finer details.

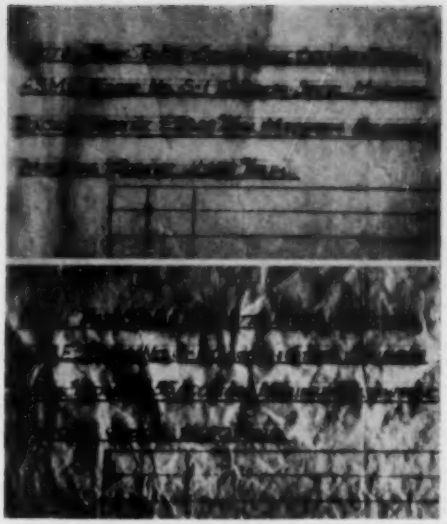

Fig. 7. Two infrared photographs of an erased and altered mechanical drawing that has been badly soiled, worn, and creased. The grazing rays in the lower photograph are less revealing than the 45 degree angle illumination from a single photoflood lamp shown above. Exposed 15 seconds at f/16 using a Wratten No. 87 filter.

Permanent inks with a large percentage of absorbing iron pigment, and highly absorbent carbon inks showed little change except for increased opacity (Fig. 4). Differences in infrared recording of many permanent inks are more apparent when photographed through Wratten Nos. 88 and 87 filters than with the No. 25.

In the examination of inks, filters should be selected for specific functions. The higher wavelengths (710 mμ to 900 mμ) have a cutting action that filters out obliterating matter and lightens backgrounds which do not respond to lower wavelength regions. An even greater degree of transparency can be had through the use of infrared transillumination. The lower wave-length regions (590 mμ to 700 mμ) are very effective for the freely transmitting substances and are employed where extreme filtering is undesirable.

### *Case Examples*

The following court cases involving inks are briefly cited: Infrared photography revealed two distinct kinds of black ink on an altered note that appeared perfect by visual examination. The use of the 760 mμ wavelength region (Wratten No. 87 filter) showed how grades on a high school record were changed from the low seventys to the high ninetys. When the stamped impression and red lettering were removed from an altered receipt important pencilled standards and an erasure were revealed; a Wratten No. 25 proved most effective in this case. (Fig. 6). After a witness in Cuyahoga Probate Court swore that the same inks had been used to write an entire receipt, it was possible to show that interlineations were made with another type of ink.

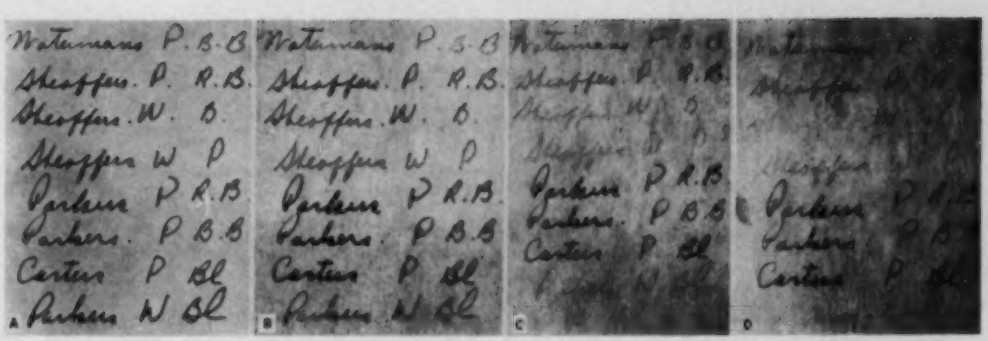

Fig. 5. Writing ink specimens photographed (A) by visible light on panchromatic film, (B) by a combination of red and infrared radiation using infrared film and a Wratten No. 25 filter, (C) on infrared film by infrared only, using a Wratten No. 88 filter, (D) on infrared film by infrared using a Wratten No. 87 filter. The three infrared photographs were lighted by a single photoflood lamp which brings out both tonal details in the inks and structural details in the paper surface. This series illustrates the increasing transparency of certain inks to infrared as longer and longer wave lengths are used in photographing them.

Diffused lighting is most suitable for the infrared recording of inks. Cross-lighting brings out tonal characteristics with a minimum of texture (Fig. 4). A single diffused light brings out both tonal and textural details which may be desirable in some cases (Fig. 5).

To compile accurate and comprehensive data for both laboratory and court use, note should be taken of lighting, exposure, filter, time and temperature of processing, developer and paper used. In the courtroom this information should be on hand for either cross or direct examination since any variability in the above factors would give misleading results.

### Mechanical Erasures

The decipherment of mechanical erasures is controlled by three technical operations, namely, (1) lighting, (2) image size, (3) focus. The more obscure the erasure the more critical, of course, are these operations.

The lighting to be used varies with the physical nature of the erasure. Depressed erasures with little or no traces of pigment are best deciphered by concentrated grazing rays (Fig. 1A). Where there are imbedded traces of pigment the combination lighting already described or diffused lighting through a narrow slit may be most effective for bringing out BOTH TONAL AND TEXTURAL DETAILS. With the use of the grazing light exaggerated surface detail may obliterate vital data that would show more clearly with diffused 45 degree light (Fig. 7).

The raised, opposite surface of a mechanical erasure may provide more information than the erasure itself, which may be worn or rubbed down (Fig. 8). Such a condition occurred in a disputed will where the typed word, "all" was erased and the figure, "½" substituted. An infrared photograph of the opposite side made with grazing rays clearly revealed the erased word, "all".

### Pencil Writing

Infrared film is better suited than process film for the photography of obscure pencilled documents because it makes the pigment more distinct while retaining the tonal values and detail in the paper. Hence pencil writing and mechanical erasures can be recorded together without obliterating, abnormal contrast. In a court case (Fig. 7) infrared photography clearly brought out faint, worn pencil writing on a much handled and soiled mechanical drawing. A Wratten No. 87 filter was used to bring out the erased pencil lettering.

### Halation

To minimize the effect of halation from reflections of transmitted infrared radiation, documents on the copy board should be backed with black paper. Halation reduces sharpness, depth and tonal values. The effects of halation would be most evident through an extended exposure of a transmissible substance and the use of an improper backing. It is also helpful to place black paper behind the film in the film holder, especially in cases where exposures of relatively long duration are required.

## NEW BOOKS

The Identification of Molecular Spectra by R. W. B. Pearse and A. G. Gaydon. Second Edition Revised 1950, 276 pages 7½x11. John Wiley and Sons, Inc. 440 Fourth Avenue, New York 16, N. Y. $8.50. Available from PSA JOURNAL, postpaid.

Out of their extensive work with molecular spectra at Imperial College, London, the authors have developed a convenient arrangement of wave length tables divided into two parts.

The first part lists the strongest heads of the better-known band systems of each molecule, in order of wave length, together with information about their origin, intensity in various sources, and appearance.

The second part includes individual lists of band heads for each system of each molecule plus pertinent notes about the system. The scientist can refer to the list for the system he has tentatively identified in the first part as the unknown system and check for the presence of other members of the system until positive identification is made.

This revision of the 1940 edition contains considerable new data as late as November 1949 necessitating rearrangement of the tables in more compact form. Sixty-seven photographs of band systems are presented in 12 large plates.

# A THEORETICAL STUDY OF ERRORS OF FOCUSING SCALES

DR. K. PESTRECOV*, APSA

SUMMARY

This paper covers a theoretical study of those errors of focusing that may be caused by incorrect determination of the object to image distance, by mechanical inaccuracy of the focusing scale, or by deviation of the actual focal length of the lens from the nominal focal length for which the scale was computed. Differential formulas are given which permit the computation of focusing errors from the basic data: the focal length, the over-all distance from the object to the camera emulsion plane, and the corresponding focusing shift of the lens.

An attempt is made to evaluate the significance of these errors by their transfer into the object space, and by their correlation with an assumed permissible circle of confusion.

ONE of the basic requirements of any high-quality photographic camera is the ability to focus accurately within the range of object distances for which the camera is intended. This requirement can be met to any desired degree of precision by a point-by-point photographic calibration of the focusing mechanism. Such a calibration, however, is too expensive for use in production of large quantities of cameras for the general market. Therefore, standard manufacturing procedures avoid individual calibration, taking advantage of the fact that focusing errors within a certain range of magnitude are permissible when they do not noticeably affect the final photographic result.

In cameras (or lenses) equipped with focusing scales there are three possible sources of errors in focusing. The first is in discrepancies between the actual object distances and the distances determined and focused upon by the photographer. The second is in mechanical errors of the focusing mechanism or of the engraving on the scale. The third is in discrepancies between the equivalent focal length of the lens installed on the camera and the equivalent focal length for which the focusing scale was computed.

The purpose of this paper is to translate these possible errors into the resulting focusing errors, measured as the differences between the actual position of the optical image plane and the emulsion plane of the camera. The paper is confined to the derivation of some basic theoretical relationships which may be used as a basis for determining manufacturing tolerances. No deductions are, however, offered by the author as to the reasonable magnitudes of these tolerances, because the magnitudes would vary widely, depending on the criteria to be used in defining a satisfactory photograph.

Considering the variety of requirements encountered in photographic engineering and art, the author feels that the use of some arbitrary criteria for establishing the tolerances may result in misleading data. Hence, the evaluation of errors is restricted in this paper to the derivation of illustrative relationships which can be used for computing tolerances, provided certain criteria are chosen. The choice of the criteria, however, is left to the user.

While the theoretical results presented herein pertain formally to focusing scales only, some of the results are equally applicable to errors of focusing that may arise from inaccuracies of a focusing range finder, or of visual focusing on ground glass, or of twin-lens focusing. The possibilities of this generalization of the formulas will be self-evident in the following text.

* Scientific Bureau, Bausch & Lomb Optical Co., Rochester, N. Y. Presented in part at the PSA Convention, Baltimore, Maryland, 21 October 1950. Received 27 November 1950.

## Basic Optical Relationships and Sign Conventions

The basic quantities involved in this study are shown in Fig. 1. Here the lens is represented by its front (H) and rear (H′) principal planes. The object plane is O . The actual optical image plane is I ; it coincides with the camera emulsion plane C when the camera is in exact focus. Otherwise, a focusing error e (shown in the subsequent illustrations) is present. This error is considered positive if the actual image plane is farther away from the lens than the camera emulsion plane.

The mechanical distance from the object to the image plane is U . This distance does not enter into the formulas derived herein as they utilize the optical distance u, which is connected with the mechanical distance U by the following relationship:

$$u = U - HH'$$

In this study, U and u are always considered positive. The separation HH′ of the principal planes may be either positive or negative depending on whether the second (rear) principal plane H′ is on the right or on the left of the first (front) principal plane H .

The distance from the first principal plane to the object plane is denoted by s, and it will be known as the "long conjugate". The distance from the front focal point to the object plane is x . In accordance with a commonly used sign convention, these quantities will be negative in this study.

The distance from the second principal plane to the image plane is s′, and it will be known as the "short conjugate". The distance from the rear focal point to the image plane is x′. These quantities are positive. The equivalent focal length f (to be known as the focal length) is also positive.

All these quantities are connected by the following equations:

$$u = s' - s; \quad s = x - f; \quad s' = x' + f;$$
$$1/s' - 1/s = 1/f; \quad xx' = -f^2$$
$$s = -0.5u(1 + A); \quad s' = 0.5u(1 - A)$$

In the last two equations and throughout the subsequent text the following abbreviation was used:

$$\sqrt{1 - 4f/u} = A$$

In general photographic practice the only quantity which can provide a reliable basis for exact focusing is the overall distance U from the object to the image plane, as the determination of this distance involves a measurement from the readily identifiable position of the camera emulsion plane. The still widely spread practice of measuring "object distances" from the front of the lens, or its "center", or the estimated position of its first principal plane, is not favorable to exact focusing. The reason for this is that the focusing mechanism usually shifts the lens with respect to the object plane, and, hence, the "object distance" measured from any point on the lens does not remain the same before and after the focusing. Thus a certain discrepancy is introduced even if the photographer uses the same reference plane on the lens as was used by the manufacturer in computing the focusing scale. It has not been the practice, however, to indicate this reference plane on photographic lenses. While errors of focusing resulting from these possible discrepancies are usually of little practical significance, in some cases (short object distances, lenses of considerable over-all thickness) they may be sufficient to destroy the quality of a photograph.

Recognizing the need for a reliable basis for measuring object distances, the American Standards Association has approved two photographic standards[1] specifying the camera emulsion plane as the reference base for measuring object distances whenever the camera provides for interchangeability of lenses.

All the expressions derived in this paper are based on differentiations of the basic equations given above. These differentiations are straightforward. Hence, all the intermediate transformations are omitted and only the final results are given. Anyone acquainted with the fundamentals of differential calculus should be able to verify these results, provided he clearly understands that there may be one or two independent variables among the four basic quantities: s (or x), s′ (or x′), f , and u . Therefore, at the beginning of every differentiation one should establish whether the incorrect focusing involves a change of one or both independent variables, and then differentiate accordingly.

The final formulas are given here in two forms. One form contains only u and f, the two basic quantities without which the computation of focusing errors is impossible. These formulas are ready for use without the determination of any intermediate quantities, but they are still somewhat cumbersome in numerical computations. They can be further simplified by transforming them into the second form containing the value of x′, which is the distance from the second focal point to the image plane, and is also the focusing shift of the lens from its position for an object at infinity to the position for an object at the distance u from the image plane. This simplification becomes effective if a focusing table, listing the values of x′ for a given focal length and the object distances of interest in a particular investigation, is available beforehand.

Considering this necessity as well as the general utility of focusing tables for lens and camera designers and for users, a set of focusing scales for a number of focal lengths and an extended range of object distances is given in this paper (Table 1).

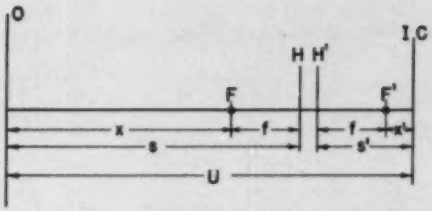


**Fig. 1. Basic quantities. Optical object-to-image distance: u = U − HH′.**

These tables are "universal" as they involve no other parameters in addition to the focal lengths and object distances, and they should prove very useful not only in the analysis of errors of focusing, but also in preliminary design work and many other practical applications. It should be noted, however, that these tables and, as it was mentioned previously, all the formulas derived in this paper, employ the optical object-to-imagine distance u , instead of the mechanical distance U , which is the distance recommended for the computation of focusing scales and for actual use by the photographer. The following illustrations also show, for the reason of simplicity, only u, and represent the lens as a pair of coinciding principal planes H,H′ .

This omission of the separation HH′ of the principal planes, and the direct substitution of u for U is equivalent to the introduction of an error equal to HH′ in the determination of object distances. Consequently, unless HH′ happens to be equal to zero in a given lens (which would be a rare case), small discrepancies will be found between the focusing shifts listed in the tables and the focusing shifts needed for accommodation of mechanical distances U of the same numerical values as listed under u in the tables. These discrepancies are usually of little significance. Even for lenses of longest focal lengths in use for general photography HH′ seldom may amount to more than a fraction of a percent of the object distance U focused upon. Nevertheless, when precision is required, the separation of the principal planes in the given lens should be determined and the relationship u = U — HH′ should be used in the computation of a focusing scale for that lens.

The use of u instead of U in the differential formulas for errors of focusing is of no consequence as these formulas are only convenient approximations indicating the orders of magnitude rather than the exact values. If the latter are needed, the errors of focusing have to be determined through cumbersome exact computations of the actual s , s′, and u for each correct and incorrect focusing situation. Even in these computations the omission of HH′ hardly ever can be of practical significance.

Reference should be made to a very good recent article by P. C. Smethurst[2] in which errors of focusing are also discussed. The approach by Smethurst to the problem of focusing is essentially the same as in this paper. Here, however, the treatment of the problem is more extended, and the results are presented in generalized formulas not limited to a few illustrative examples.

## Table I

FOCUSING SCALES BASED ON OVER-ALL OPTICAL DISTANCE FROM OBJECT TO IMAGE PLANE

| u, feet | Focal length, inches: 0.5 | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | 4.0 | 4.5 | 5.0 |
|---|---|---|---|---|---|---|---|---|---|---|
| | Focusing shift (x′) of the lens, inches | | | | | | | | | |
| 0.5 | 0.0505 | 0.2679 | | | | | | | | |
| 1.0 | 0.0228 | 0.1010 | 0.2574 | 0.5339 | 1.0505 | | | | | |
| 1.5 | 0.0147 | 0.0627 | 0.1515 | 0.2918 | 0.5000 | 0.8038 | 1.2574 | | | |
| 2.0 | 0.0109 | 0.0455 | 0.1077 | 0.2020 | 0.3348 | 0.5147 | 0.7540 | 1.0718 | 1.5000 | 2.1010 |
| 3.0 | 0.0071 | 0.0294 | 0.0683 | 0.1255 | 0.2029 | 0.3031 | 0.4288 | 0.5836 | 0.7721 | 1.0000 |
| 4.0 | 0.0053 | 0.0217 | 0.0501 | 0.0911 | 0.1458 | 0.2154 | 0.3010 | 0.4041 | 0.5263 | 0.6697 |
| 5.0 | 0.0042 | 0.0172 | 0.0395 | 0.0715 | 0.1139 | 0.1672 | 0.2321 | 0.3095 | 0.4002 | 0.5051 |
| 6.0 | 0.0035 | 0.0143 | 0.0326 | 0.0589 | 0.0934 | 0.1366 | 0.1890 | 0.2510 | 0.3231 | 0.4059 |
| 8.0 | 0.0026 | 0.0106 | 0.0242 | 0.0435 | 0.0687 | 0.1001 | 0.1379 | 0.1822 | 0.2334 | 0.2917 |
| 10 | 0.0021 | 0.0085 | 0.0192 | 0.0345 | 0.0544 | 0.0790 | 0.1085 | 0.1430 | 0.1827 | 0.2277 |
| 15 | 0.0014 | 0.0056 | 0.0127 | 0.0227 | 0.0357 | 0.0517 | 0.0708 | 0.0931 | 0.1185 | 0.1472 |
| 25 | 0.0008 | 0.0034 | 0.0076 | 0.0135 | 0.0212 | 0.0306 | 0.0418 | 0.0548 | 0.0696 | 0.0862 |
| 50 | 0.0004 | 0.0017 | 0.0038 | 0.0067 | 0.0105 | 0.0152 | 0.0207 | 0.0270 | 0.0343 | 0.0424 |
| 100 | 0.0002 | 0.0008 | 0.0019 | 0.0033 | 0.0052 | 0.0075 | 0.0103 | 0.0134 | 0.0170 | 0.0210 |
| 200 | 0.0001 | 0.0004 | 0.0009 | 0.0017 | 0.0026 | 0.0038 | 0.0051 | 0.0067 | 0.0085 | 0.0105 |
| 500 | 0.0000 | 0.0002 | 0.0004 | 0.0007 | 0.0010 | 0.0015 | 0.0020 | 0.0027 | 0.0034 | 0.0042 |
| 1000 | 0.0000 | 0.0000 | 0.0002 | 0.0003 | 0.0005 | 0.0008 | 0.0010 | 0.0013 | 0.0017 | 0.0021 |
| 2000 | 0.0000 | 0.0000 | 0.0001 | 0.0001 | 0.0003 | 0.0004 | 0.0005 | 0.0007 | 0.0009 | 0.0010 |
| Infinity | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

u = optical distance = mechanical distance minus separation of nodal points

### Error of Focusing Caused by an Incorrect Determination of the Object Distance

The photographer determines the object to image distance with an error $e_u$ (negative in this case), and sets his focusing scale correctly for an incorrect object distance $u_w = u + e_u$, and, consequently, for an incorrect long conjugate $s_w = s - e_u$, where s is the actual distance from the lens to the object plane 0. This situation is illustrated in Fig. 2. In this case, s is the only independent variable, and the error of focusing e is determined by the following equation:

$$e = ds' = \frac{\delta s'}{\delta s} ds, \text{ where } ds = e_u$$

The differentiation results in the following formula for the error of focusing:

$$e = \frac{0.5u\,(1 - A) - f}{0.5u\,(1 + A) - f} e_u = \frac{x'^2}{f^2} e_u$$

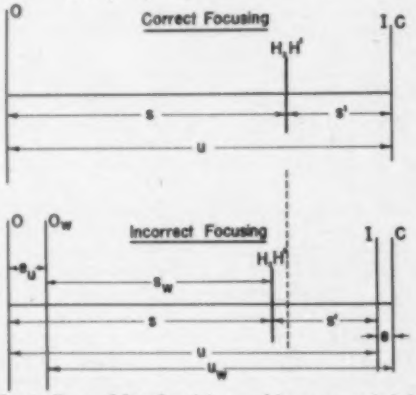


Fig. 2. Error of focusing (e) caused by an error ($e_u$) in determining the object distance.

If the object distance u is considerably greater than the focal length f, the value of A becomes nearly equal to $1 - 2f/u$, and the focusing error e becomes zero. This indicates that the same error in determining the object distance is of more importance for near distances than for far, which is a fact easily discernible in a direct inspection of the values of x′ listed in Table 1.

The approximation given by the differential formulas for this error should be entirely sufficient for any reasonable situation that may be encountered in actual practice. This may be illustrated by the following example.

If the focal length is 2 inches, and the distance from the object to emulsion plane is 60 inches, but the photographer erroneously determines this distance as 54 inches and sets his lens accordingly, the exact computed error of focusing is $e = -0.0086''$, while the differential formulas give $e = -0.0077''$.

### Error of Focusing Caused by Mechanical Inaccuracy of the Focusing Scale

The situation is illustrated in Fig. 3. Here, due to a mechanical error $e_m$ (positive in this case), the long conjugate differs from its correct value by $ds = e_m$. The error of focusing is:

$$e = du = \frac{\delta\,(s' - s)}{\delta s} ds, \quad \text{where s is the independent variable}$$

The resulting formulas are:

$$e = \frac{uA}{f - 0.5u(1 + A)} e_m = \left(\frac{x'^2}{f^2} - 1\right) e_m$$

Two interesting observations can be made from these formulas. The first is that for large object distances (u large, x′ small) the focusing error e is nearly of the same absolute value as the mechanical error of setting, but of the opposite sign (a mechanical error is considered positive if the lens is set farther away from the emulsion plane than it should be for the correct focusing).

**Table I (Continued)**

FOCUSING SCALES BASED ON OVER-ALL OPTICAL DISTANCE FROM OBJECT TO IMAGE PLANE

| | Focal length, inches | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 5.5 | 6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | 9.0 | 9.5 | 10.0 |
| u, feet | Focusing shift (x') of the lens, inches | | | | | | | | | |
| 3.0 | 1.2750 | 1.6077 | 2.0132 | | | | | | | |
| 4.0 | 0.8365 | 1.0294 | 1.2519 | 1.5081 | 1.8031 | 2.1436 | 2.5386 | 3.0000 | 3.5455 | 4.2020 |
| 5.0 | 0.6253 | 0.7621 | 0.9168 | 1.0911 | 1.2868 | 1.5061 | 1.7516 | 2.0263 | 2.3341 | 2.6795 |
| 6.0 | 0.5000 | 0.6061 | 0.7250 | 0.8575 | 1.0045 | 1.1672 | 1.3466 | 1.5442 | 1.7614 | 2.0000 |
| 8.0 | 0.3574 | 0.4308 | 0.5122 | 0.6020 | 0.7005 | 0.8082 | 0.9254 | 1.0527 | 1.1905 | 1.3394 |
| 10 | 0.2782 | 0.3344 | 0.3963 | 0.4643 | 0.5385 | 0.6191 | 0.7063 | 0.8004 | 0.9016 | 1.0102 |
| 15 | 0.1792 | 0.2146 | 0.2534 | 0.2957 | 0.3416 | 0.3912 | 0.4445 | 0.5016 | 0.5625 | 0.6275 |
| 25 | 0.1047 | 0.1251 | 0.1473 | 0.1714 | 0.1975 | 0.2255 | 0.2555 | 0.2875 | 0.3215 | 0.3576 |
| 50 | 0.0514 | 0.0612 | 0.0720 | 0.0836 | 0.0962 | 0.1096 | 0.1240 | 0.1392 | 0.1554 | 0.1725 |
| 100 | 0.0254 | 0.0303 | 0.0356 | 0.0413 | 0.0475 | 0.0541 | 0.0611 | 0.0685 | 0.0764 | 0.0848 |
| 200 | 0.0127 | 0.0151 | 0.0177 | 0.0205 | 0.0236 | 0.0268 | 0.0303 | 0.0340 | 0.0379 | 0.0420 |
| 500 | 0.0051 | 0.0060 | 0.0071 | 0.0082 | 0.0094 | 0.0107 | 0.0121 | 0.0135 | 0.0151 | 0.0168 |
| 1000 | 0.0025 | 0.0030 | 0.0035 | 0.0041 | 0.0047 | 0.0054 | 0.0060 | 0.0068 | 0.0075 | 0.0084 |
| 2000 | 0.0013 | 0.0016 | 0.0017 | 0.0021 | 0.0024 | 0.0027 | 0.0030 | 0.0034 | 0.0037 | 0.0042 |
| Infinity | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

u = optical distance = mechanical distance minus separation of nodal points

The second is that the error of focusing diminishes with decreasing object distances, and it vanishes for $u = 4f$ (one-to-one imagery), as then x' becomes equal to f, and the expression in the parenthesis becomes equal to zero.

The accuracy of these differential formulas is excellent. For example, for $u = 60''$, $f = 2''$, and $e_m = +0.005''$, the exact value of the focusing error is $-0.0050''$; the same value is obtained also from the differential formulas.

### Error of Focusing Caused by Deviation of the Focal Length from Its Nominal Value

It is common practice to design a focusing scale for a certain nominal value of the focal length, and then to use this scale for a range of focal lengths within the tolerances unavoidable in manufacturing. In analyzing the errors of focusing which may be caused by a deviation $e_f$ of the focal length from its nominal value, the following two cases need to be considered.

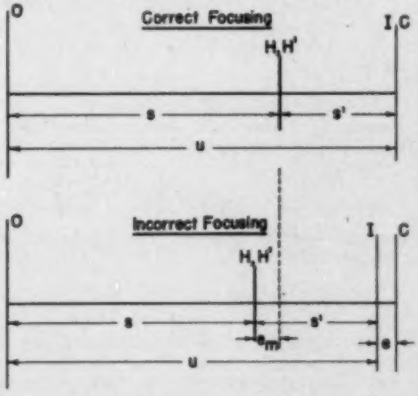


Fig. 3. Error of focusing (e) caused by a mechanical error ($e_m$) in the focusing scale.

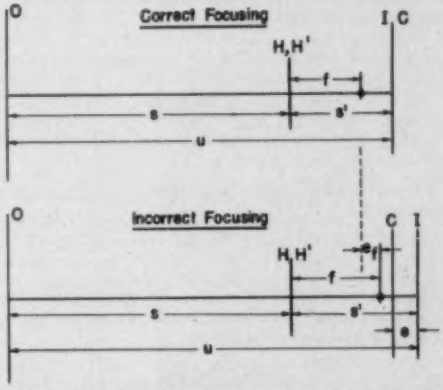


Fig. 4. Error of focusing (e) caused by a deviation ($e_f$) of the focal length from its nominal value. The lens is not parfocalized for infinity.

a) *The lens is not parfocalized.* If we disregard manufacturing variations in the optical and mechanical parts of lenses and in the registration distances of cameras (an analysis of mechanical errors was given previously), a convenient assumption can be made that, irrespective of deviations of the focal lengths from their nominal value, all the manufactured lenses (of the same construction and the same nominal focal length) will occupy identical positions with respect to the camera emulsion plane and to the object plane. This position is established by the exactly focused lens of the nominal focal length.

The situation is illustrated in Fig. 4. Here the lenses, indicated by the symbol H,H', occupy identical positions. Hence, the long conjugate s is a constant, and the independent variable is the focal length f . Then the error of focusing is determined by the following differentiation:

$$e = \frac{\delta s'}{\delta f}\, df$$

The final formulas are:

$$e = \frac{u}{0.5u(1 + A) - f}\, e_f = \frac{ux'}{f^2}\, e_f$$

When u is much larger than f , the following approximation may be used:

$$e = \frac{u}{u - 2f}\, e_f$$

The accuracy of these differential formulas is usually very satisfactory. Thus, for $u = 60''$, $f = 2''$, and $e_f = +0.10''$ (5% deviation from the nominal value), the exact computations yield $e = +0.1075''$, while the differential formulas give $e = +0.1073''$, and the approximate differential formula gives $e = +0.1071''$.

b) *The lens is parfocalized for infinity.* This case is illustrated in Fig. 5. In the absence of other errors, the parfocalization of a lens, whose focal length differs by $e_f$ from its nominal value, results also in $e_f$ change of the long conjugate. The independent variables are s and f . Consequently, the error of focusing is given by the following equation:

$$e = du = \frac{\delta s'}{\delta s}\, ds + \frac{\delta s'}{\delta f}\, df - ds \text{ , where } ds = df = e_f$$

The resulting formulas are:

$$e = 2\,\frac{0.5u(1 - A)}{0.5u(1 + A) - f}\, e_f = 2\,\frac{(x' + f)x'}{f^2}\, e_f$$

When u is considerably larger than f , the further approximation is:

$$e = 2\,\frac{f}{u - 2f}\, e_f$$

The numerical results that may be obtained with these formulas are usually in entirely satisfactory agreement with the results of exact computations.

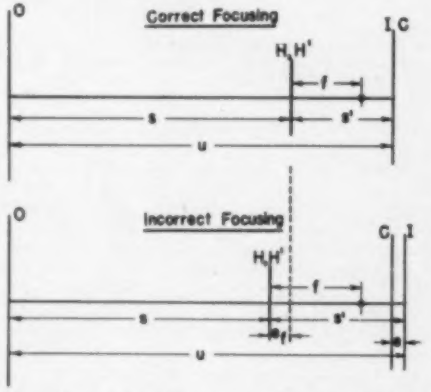


Fig. 5. Error of focusing (e) caused by a deviation ($e_f$) of the focal length from its nominal value. The lens is parfocalized for infinity.

It is of interest to note that, as may be expected, the error of focusing in the parfocalized case is considerably smaller than it is in the not parfocalized case. The approximate formulas derived for these two cases yield the following ratio:

$$\frac{e \text{ (parfocalized)}}{e \text{ (not parfocalized)}} = \frac{2f}{u}$$

This ratio is very small in most cases encountered in general photographic practice. Thus, with the numerical data used in the preceding example, we find that the error with a parfocalized lens should be only about one fifteenth of the error with a lens that is not parfocalized; this deduction is in harmony with the exact computational result, which gives a ratio of one fourteenth.

## Errors of Focusing Transferred into the Object Space

When attempts are made to evaluate the significance of an error of focusing, the most readily understandable interpretation may be found in the value showing the distance between the object plane on which the camera is presumably focused and the object plane actually in exact focus on the camera emulsion plane. The procedure of determining this difference implicitly involves the optical transfer of an error from the image to the object space, or a transformation of an error in the short conjugate into its counterpart in the long conjugate.

The geometry of this transfer is illustrated in Fig. 6. Here the object focused on is at O , and its conjugate image plane is at I ; the error of focusing is e . Consequently, the object plane actually in focus on the camera emulsion plane C is $O_c$ ; the distance from the plane $O_c$ to the plane O "focused on" is E (negative in this case). This distance E represents the error of focusing e transferred optically into the object space.

Differentiation of the basic optical formulas yields the following transfer formula:

$$E = \frac{0.5u(1 + A) - f}{0.5u(1 - A) - f}\, e = \frac{f^2}{x'^2}\, e$$

This formula may be transformed into more illustrative forms by substitution of the previously derived expressions for the error of focusing e . Thus we will obtain the following set of new transfer formulas for the various cases analyzed in this paper.

When an error $e_u$ is made in the determination of the *object distance,* the obvious relationship is $E = e_u$ .

In presence of a *mechanical error of setting* $e_m$ , the transferred error of focusing is:

$$E = \frac{uA}{f - 0.5u(1 - A)}\, e_m = \left(1 - \frac{f^2}{x'^2}\right) e_m$$

When u is considerably greater than f , the following approximation holds:

$$E = -\frac{u}{x'}\, e_m$$

The latter expression shows the interesting fact that, within the approximation of the formula, the relative (percent) transferred error (E/u) in the object distance is numerically equal to the relative (percent) error ($e_m/x'$) in the focusing shift $x'$ .

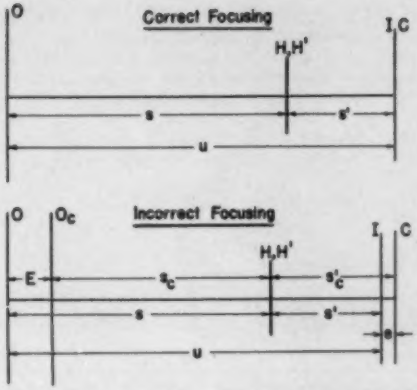


**Fig. 6. Error of focusing (e) transferred into the object space. The transferred error in the long conjugate is E.**

Taking again for an example a 2-inch lens focused at an object distance of 60″ with a mechanical error of +0.005″, we obtain the following numerical results. The focusing shift for u = 60″ is x′ = 0.0715″ (see Table 1); the error of +0.005″ is 7.0 percent of the focusing shift. The exact value of the transferred error E is — 3.65″ or 6.1 percent of the object distance. The value of E from the differential formulas is — 3.9″, and its value from the approximate differential formula is — 4.2″.

*If the focal length differs by* $e_f$ from its nominal value, and *the lens is not parfocalized*, the transferred error of focusing it:

$$E = \frac{u}{0.5u(1 - A) - f} e_f = \frac{u}{x'} e_f$$

Approximately, when u/f is large,

$$E = \frac{u^2}{f^2} e_f$$

These formulas should be used with some caution to avoid misleading results. Their peculiarity is that the results obtained with them are generally in good agreement with the exact computations only when the deviation $e_f$ is negative; if it is positive, the reliability of the formulas is limited to the cases when $e_f$ is significantly smaller than x′.

The remaining case, now under consideration, occurs *when the focal length differs by* $e_f$ from its nominal value, *and the lens is parfocalized for infinity*. Then the transferred error of focusing is given by the following expressions:

$$E = \frac{u(1 + A)}{f} e_f = 2\left(\frac{f}{x'} + 1\right) e_f$$

And, approximately, when u/f is large: $E = 2\frac{u}{f} e_f$.

The approximate formula reveals an extremely interesting and useful relationship. It shows that the relative (percent) transferred error (E/u) in the object distance is independent of the focal length of the lens, and is equal to twice the relative (percent) deviation $(2\frac{e_f}{f})$ of the focal length from its nominal value.

For example, for u = 60″, f = 2″, and $e_f$ = +0.1″ (or 5 percent), the exact computations give E = +5.93″, which is very near to 10 percent of 60″ as predicted by the formula above. The differential formula yields E = +5.8″, and the further approximate formula gives E = +6.0″; both these values are in very good agreement with the exact value.

Finally we may note that the approximate differential formulas just derived show that the ratio of the transferred error in the parfocalized case to that in the not parfocalized case is 2f/u, which is exactly the same ratio as was previously derived for the respective errors of focusing in the image space. For the transferred errors, however, the validity of the ratio is also within the limitations noted above for the transfer formulas in the unparfocalized case.

## Correlation of Errors of Focusing with the Permissible Circle of Confusion

While the transfer formulas provide an illustrative basis for determining the significance of errors of focusing, they do not contain in themselves a criterion which would establish the tolerances. Indeed, if, as it was computed in an example, a mechanical error of +0.005″ results, at an object distance of 60″, in a discrepancy of —3.65″ between the object plane "focused on" and the object plane actually in focus, the decision whether or not this discrepancy is disturbing should be made by the designer or photographer on the basis of experience and familiarity with the situations that may be encountered in practice. This decision necessarily involves subjective judgment.

Unfortunately, entirely objective criteria do not exist, and, hence, cannot be offered by the author. The nearest approach to such criteria may be found in the concept of a permissible circle of confusion. If the permissible circle of confusion is reasonably well established on the basis of theoretical considerations or of some experimental data, it can be conveniently used for determining the tolerances for errors of focusing and for the causative errors.

Let c be the diameter of the assumed permissible circle of confusion. Then the following approximate relationship exists between c, the associated error of focusing e, and the f-number F of the lens:

$$e = \pm Fc$$

This relationship establishes the maximum permissible error of focusing for given c and F.

By substituting cF for e in the formulas previously derived, we may determine the tolerances in terms of c and F. Thus, we find the following tolerance for the error $e_u$ in determining the object distance (and also for any transferred error E):

$$e_u \text{ and } E \text{ tolerance} = \pm \frac{Ff^2c}{x'^2}$$

For example, if the diameter of the permissible circle of confusion is 0.001″ (which is a rather strict criterion), the focal length f = 2″, the speed of the lens is f/2 (F = 2), and the object distance is 60″ (x′ = 0.0715″), the resulting tolerance for $e_u$ and E is ±1.6″. This is, of course, a very severe tolerance, which can be liberalized

only by accepting a larger circle of confusion or by stopping the lens down, or by using both these expedients.

Formulas can be derived in a similar manner for tolerances for mechanical errors, and for deviations of focal lengths from their nominal values. The required substitutions and transformations are simple; hence, the derivation of these formulas is left to the interested readers.

The extensive contribution by Miss Beatrice N. Marble to this work is gratefully acknowledged by the author.

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# *Photomicrography by Incident Light in Organic High Polymer Research**

ERNST A. HAUSER†

SEVERAL YEARS ago the electron microscope was applied for the first time to obtain photographs of high molecular organic compounds such as, for example, natural and synthetic rubbers deposited on very fine platinum wire gauze from solutions in organic solvents. Although the results achieved offered important information, it could not be denied that the electron bombardment these substances had to undergo during exposure caused drastic changes in the consistency of the sample. Besides this the electron microscope is an instrument which calls for specially trained personnel, its use is expensive and therefore the instruments are not available for many who would be interested in obtaining a deeper insight into the composition and structure of high molecular organic compounds.

Since most of the preparations are opaque, microscopy by transmitted light could not be applied. An ideal solution to the problem was found in the use of the "Ultropak" microscope. This instrument was developed by E. Leitz in Wetzlar, Germany. It differs from a standard microscope insofar as it uses incident light for illumination, as metallurgical microscopes do. However, the "Ultropak" also differs from the metallurgical microscopes in that the rays of light used for the illumination of the specimen are not focussed on the preparations through the objective but through an independent lens ring surrounding the objective. This results in an ultramicroscopic type of illumination. Only light reflected from any discontinuity in the preparation is then reflected through the objective of the microscope into the eyepiece or the photomicrographic equipment. The arrangement furthermore has the advantage that the lens ring surrounding the objective can be adjusted independently of the focal length of the objective, thus permitting the light to illuminate the preparation at an angle most suitable for the condition of the surface under investigation.

This type of illumination also permits studying the preparation under various conditions while it is under observation, as, for example, at varying temperatures if a heatable substage is used. An "Ultropak" microscope equipped with such a substage and a Leica camera casing connecting with a Micro-Ibso attachment is shown in Figure 1.

The "Micro-Ibso" attachment, also developed by E. Leitz, differs drastically from standard photomicrographic equipment. Instead of using a special front lens, the standard microscope eyepiece is substituted therefor. This also serves as the connecting link between the camera and the microscope. Above it, an easily removable prism permits the light entering through the eyepiece to be directed either at right angles into the observer's eye, thus permitting him proper focussing of the preparation, or the light enters after switching the prism out of the light path through a Compur shutter directly into the camera. The Micro-Ibso attachment is so constructed that it can be attached directly to the housing of a standard Leica camera.

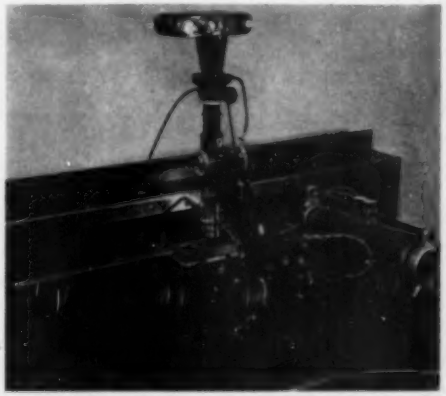

**Fig. 1. Ultropak microscope equipped with Micro Ibso attachment, Leica camera casing, and electrically heatable substage.**

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†Massachusetts Institute of Technology and Worcester Polytechnic Institute.

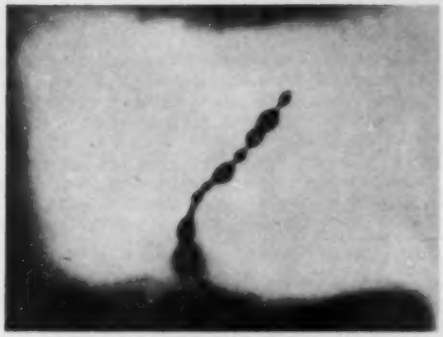

Fig. 2. Balata magnified 2200× without an electron microscope. The specimen shows changes in morphology after heating to 70C on the "Ultropak" microscope stage and immediately cooling when the beaded string breaks. The 1100X microscope record was enlarged 4×, then reduced to make the half-tone printing plate.

In order to be able to make photographs which resemble the preparation as closely as possible it has been found that color film is the ideal medium. Besides fidelity, developed color film has practically no grain and therefore permits extreme enlargements. An enlarged print on bromide paper is then a reversed picture, so to speak, because black areas in the color film will appear white and vice versa.

Figure 2 was made with an actual microscopic magnification of ×1100 and was then enlarged four fold; it is absolutely comparable to what the electron microscope had to offer. Since the development of this technique, it has already offered extremely valuable information in research pertaining to elastic high polymers.

The occurrence of "beads" and their size offer the colloid chemist visual evidence that the high polymer is not of uniform composition. The "beads" represent the low molecular weight fractions of the high polymer, whereas the strands represent the high molecular weight fractions. The large beads indicate a very low molecular weight fraction and their size is a fairly accurate indication as to the molecular weight distribution in per cent. Besides this, the temperature at which these beads occur also offers the first visual proof of how important the molecular configuration of high polymers is in regard to their elastic properties. Balata will only show the formation of beads if the preparation is heated to temperatures above 60C. At this temperature, the long-chain molecules have sufficient freedom of oscillation to overcome the van der Waal's forces preventing the polyisoprene molecules exhibiting trans-configuration from slipping by each other. Natural rubber, which is of the cis-configuration, has no obstruction, however, even at normal temperature and therefore permits the formation of beads much earlier.

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# PROBLEMS INVOLVED IN THE RAPID PROCESSING OF ANSCO COLOR DAYLIGHT FILM AND PRINTON


JOHN G. HAINSWORTH*


THE standard processing time for Ansco Color Film and Printon is approximately 90 minutes. The U.S. Air Force, desiring a shorter process using conventional equipment, sponsored research which resulted in a 20 minute process for Ansco Color Daylight Film and a 16 min. process for Ansco Color Printon. The U.S. Air Force will be the first large-scale user of this accelerated procedure employing it in processing 16mm Ansco Color Film exposed in gun cameras. An existing 16mm processing machine was adapted for the rapid processing procedure. The complete process (including drying) requires 31 minutes with that equipment.

**Processing Stages Standard 90 min.**

The following is a very brief description of the function of each step in the standard processing of Ansco Color Film and Printon.

*First Development*

The first developer is a metol-hydroquinone developer which produces a *negative* silver image. This step controls, to a great extent, the speed of the film.

*First Shortstop*

The acetic acid-sodium acetate shortstop rapidly stops development thus enabling precise control of the time of first development. It also aids in the removal of the first developer.

*Hardener*

A chrome alum solution hardens the emulsion.

*Water Wash*

The wash removes the first developing agent and other chemicals.

*Second Exposure*

This produces a latent image in the undeveloped silver halide of the emulsion.


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Delivered at the PSA Convention, Baltimore, Maryland 21 October 1950. Received 18 January 1951.

*Color Development*

The color developing agent reduces the re-exposed silver halide to metallic silver and is itself oxidized. The oxidized color developer then couples with the dye-forming compounds present in the three emulsion layers to produce a *positive* color image.

*Second Shortstop*

This acetic acid shortstop rapidly terminates the color developing reaction.

*Hardener*

The chrome alum solution is used again for further hardening.

*Water Wash*

The color developing agent is removed from the film at this stage.

*Silver Bleach*

The silver images produced during both developing reactions are converted back to silver bromide with a solution of potassium ferricyanide and postassium bromide leaving a positive dye image.

*Wash*

The bleaching solution is removed from the film.

*Fixer*

The fixer does its normal job of removing silver halide.

*Final Wash*

Here the residual hypo and any other processing chemicals are washed from the film.

## Factors Involved in Rapid Processing of Black-and-White Film

Little has appeared in the literature on the rapid processing of color film. Much has been written, however, on fast processing of black-and-white film. Many of the same procedures and techniques apply equally well to both. A review of some of the more important factors follows.

Ansco Color Printon Time Table for Normal and Rapid Processing

| | Standard (Temp. = 68 F) | Rapid (Temp. = 80 F) |
|---|---|---|
| 1st Developer | 14 min. | 5 min. |
| 1st Shortstop | 2 min. | 1 min. |
| Wash | 3 min. | 2 min. |
| Second Exposure | — | — |
| Color Developer | 14 min. | 1½ min. |
| Color Shortstop | 1 min. | 1 min. |
| Hardener | 4 min. | none |
| Wash | 8 min. | none |
| Bleach | 8 min. | 1 min. |
| Wash | 10 min. | ¼ min. |
| Fixer | 4 min. | ¾ min. |
| Wash | 20 min. | 3 min. |
| Total time | 88 min. | 15½ min. |

### Factors Affecting Rate of Development

*Alkalinity*

One of the most important factors affecting the rate of development is the alkalinity of the solution. At one time the choice of the cation employed was thought to be important[1] but recent publications claim that the pH of the solution is the decisive factor[2]. Hence, the use of a developer with as high a pH as possible is indicated in rapid processing. The upper limit is usually determined by the tendency of the gelatin of the emulsion to soften and reticulate.

*Temperature*

As with most chemical reactions, temperature has a pronounced effect on the rate of development. The temperature coefficient varies depending upon the developing agent and upon the emulsion used but it is particularly high for hydroquinone[3]. Once again the physical hardness of the gelatin limits the temperature at which a film may be processed.

*Concentration of Developing Agent*

The concentration of the developing agent has less effect on development rate than either pH or temperature. Concentration is important, however, with respect to the exhaustion life of the developing solution.

*Turbulation*

Continuous agitation is essential or some method of turbulation which assures optimum processing.

*Use of Silver Halide Solvents*

Compounds which dissolve silver halides (e.g. sodium thiosulfate, sodium thiocyanate) increase the rate of development[4].

*Use of Chemicals Which Swell Gelatin*

Urea and similar compounds have been claimed to accelerate development because of their ability to swell gelatin thus allowing more rapid penetration of the developer[5].

*Use of Certain Organic Amines as Accelerators*

Organic amines, both aliphatic and aromatic, accelerate development[6]. The exact mechanism involved is not definitely known.

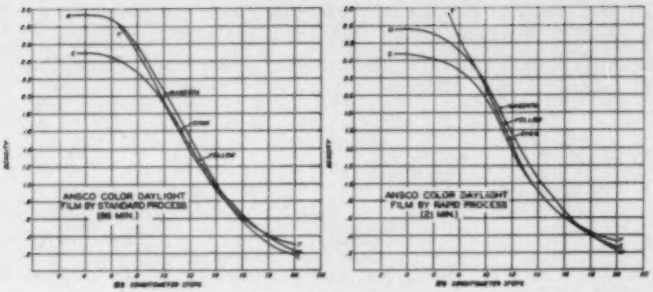
### Factors Affecting Rate of Fixing

Increasing the temperature of a normal sodium thiosulfate (hypo) bath increases the rate of fixing. A much more effective way to speed up fixation, however, is to use ammonium thiosulfate[7]. It has been shown that ammonium thiosulfate is approximately four times as rapid a fixer as sodium thiosulfate at a given temperature.

The addition of sodium thiocyanate to an ammonium thiosulfate solution further accelerates the fixing as does sodium cyanide although use of the latter is inadvisable because of its toxicity.

### Factors Affecting Rate of Washing

Washing is more rapid following a non-hardening fixing bath than after a chrome or potassium alum fixing bath. The physical hardness of the film is important in this connection as it is often necessary to employ a




**Tricolor analysis curves of daylight type Ansco Color Film processed normally (left) and processed by the rapid processing technique (right). Changes in the characteristics of the individual color images due to the rapid processing treatment are negligible.**

hardening-fixing bath to reduce swelling and reticulation.

The wash water temperature is very important. For example an increase in temperature from 5 C to 24 C doubles the rate of hypo removal.

The pH of the wash water plays an important part in the washing rate and various authors have suggested the use of an alkaline rinse between the fixing and washing steps[8].

Various hypo eliminators such as ammonia-hydrogen peroxide or sodium chlorite[9] have been used to remove traces of hypo remaining in the film thus effectively shortening the washing period.

### Factors Affecting Rate of Drying

The drying of gelatin presents certain difficulties which must be taken into account. If water is removed from the surface at a much greater rate than it diffuses through the gelatin to the surface strains are set up which may cause reticulation[10]. The use of too high a temperature or of air which is too dry may also cause case hardening which actually retards drying.

Hard emulsions dry faster because there is less water absorbed. They also permit the use of elevated drying temperatures.

The use of a saturated salt solution prior to drying has been suggested but although this accelerates the drying, the problem of removing the salt remains.

Rinsing in alcohol also speeds up the drying process[11] but care must be taken in choosing the proper concentration to avoid opalescence in the gelatin or extraction of plasticizers from the film base.

## Problems Encountered in Accelerating Each Stage of Processing

A description follows of the problems encountered while attempting to accelerate each stage of processing of Ansco Color Daylight Film (and Printon) and methods developed to solve these problems. It may be mentioned here that during hand processing of cut sheet film in tanks it was necessary to agitate at the rate of 60-100 strokes per minute in order to avoid the formation of streaks, thus requiring some modification of existing processing equipment.

### *Step No. 1—Prehardening Bath*

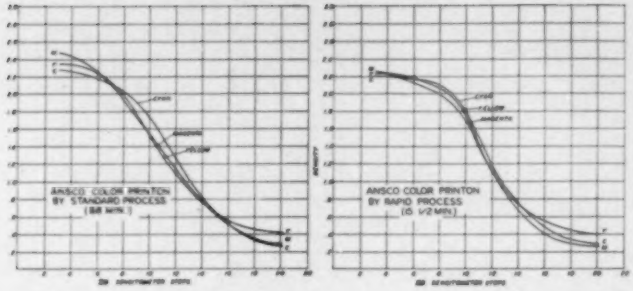
From the foregoing brief review of the factors involved in rapid processing of black-and-white film it is apparent that the harder the emulsion the greater the probability of success in reducing the processing time. Initial attempts to decrease the processing time for Ansco Color Film by raising the temperature of the processing solutions and by increasing the alkalinity of the first developer showed the definite possibility of attaining a 20 minute process but also demonstrated the need for a harder emulsion.

Increasing the physical hardness of a given color film by using a hardener in one or more of the emulsion layers or in an overcoat is a long and involved problem. Many aldehyde gelatin hardeners react with the active methylene groups in the color formers present in the emulsion. Some hardeners cause loss of emulsion speed. The use of aldehyde hardeners in the emulsion may cause fogging and certainly would affect the storage life of the film. These effects would have to be studied at length and as time was an important consideration it was decided to avoid making emulsion changes or modifications.

The need for hardening during processing was therefore apparent. It was soon determined that once the emulsion had been substantialy softened and swollen due to elevated temperatures or caustic developers, it was very difficult to harden the gelatin enough to prevent reticulation during the final wash. Neither chrome alum hardening baths following the developers nor alkaline formalin baths prior to the final wash were capable of adequately hardening the swollen emulsion. A hardening bath prior to first development was thus indicated since the probability of hardening would be greater if swelling had not already occurred.

The first prehardener investigated was an alkaline solution of formaldehyde. Excellent hardening was obtained permitting the use of processing solutions at 120F but the resulting color balance showed a serious loss of yellow and change in the hue of the cyan. Considerable effort was made to overcome this undesirable shift in color balance since an alkaline formaldehyde bath would be an ideal solution to work with from the standpoint of solution stability. No satisfactory method was found for overcoming the several drawbacks of formaldehyde as any method used (high concentration of formaldehyde for short periods; low concentrations for long periods or fuming with formaldehyde gas) produced a very blue color balance whenever satisfactory hardening was attained.

Theoretically the blue color balance caused by formaldehyde prehardeners could be at least partially corrected by using a black and white developer which would develop the bottom (red sensitized—yields cyan) and




**Characteristic curves of the three colored layers of Printon processed in 88 minutes (left) using normal processing procedures and Printon processed in only 15½ minutes (right) using rapid processing treatment in solutions at 80F. Slight changes in the separate layers are pictorially unimportant.**

middle (ortho sensitized—yield magenta) layers relatively more than the top (un-sensitized—yields yellow) layer. This would produce relatively more yellow dye upon subsequent color development. Various black and white developers were investigated but none was an improvement over metol-hydroquinone.

A similar correction of the color balance could conceivably be produced by the use, in the first developer, of a non-diffusing anti-foggant. This would cause a speed reduction in the top layer thus yielding more yellow dye upon color development. Several compounds were investigated and one showed some promise in this respect. Unfortunately it slowed down the emulsion and required the use of more sodium hydroxide in the developer thus increasing the tendency of the emulsion to swell and reticulate.

When it became apparent that formaldehyde was not readily applicable a considerable number of compounds were investigated as potential gelatin prehardeners. A few of these are listed below along with brief comments.

| *Compound* | *Reason for Trial and Results* |
|---|---|
| Ethyl trichlorosilane in $CCl_4$ | Reacts readily with OH or $NH_2$ containing materials. Did not harden gelatin. |
| Ethyl Chlorocarbonate | Ditto. |
| Formamide | The carbonyl reacts with active methylene groups. Did not harden gelatin. |
| Cyanuric chloride | German App. 69,657 claims this hardens film. Did not work successfully. |
| Reinecke's Salt | Precipitant for amino acids and proteins. Did not harden the emulsion. |
| Crotonaldehyde | This did harden but fogged badly. |
| Glyoxal | Hardened the emulsion. See below. |

As mentioned above, the one compound which appeared most promising was glyoxal. Initial experiments showed that alkaline solutions of glyoxal hardened gelatin satisfactorily and there was definitely less undesirable shift in color balance than with formaldehyde. There were, however, three disadvantages connected with the use of glyoxal namely: (a) a tendency to cause a yellow stain, (b) a slight reduction of maximum density and (c) a short solution life due to oxidation of the glyoxal.

These three disadvantages of the glyoxal prehardener were overcome in the following ways:

The yellow stain was reduced by the addition of a very small amount of formalin to the prehardening bath. The quantity used was too small to cause any undesirable shift of the color balance.

The maximum density was increased by the addition of an anti-foggant (benzotriazole) to the prehardener.

Inasmuch as the pH of an alkaline glyoxal solution diminishes upon ageing and the solution becomes ineffective as a gelatin hardener in approximately 7 hours, an extended study was made in an attempt to retard this deterioration. Several materials (all boron compounds) were found which extended the useful life of the prehardener from 7 to 30 hours. This solution life is considered practicable as the solution is fairly cheap and a fresh prehardener can be used daily.

A further improvement in the prehardening solution was made by the addition of sodium sulfate. This reduces initial swelling and improves the efficiency of the glyoxal.

The prehardener temperature is maintained at 80 F as are all other solutions and wash water.

It may be mentioned that Ansco Printon, which has a slower and harder emulsion than Ansco Color Daylight Film, requires no prehardening prior to rapid processing at 80 F.

*Step No. 2—Rinse*

Some method for removing the major portion of the prehardening solution from the film to prevent gross contamination of the first developer is required. In hand operation a dip rinse in a wash tank is adequate. In processing 16mm motion picture film an air squeegee has been used fairly successfully but this is not ideal as the danger of oxidation is increased. A spray wash followed by an air squeegee would be the best procedure.

*Step No. 3—First Development*

A metol-hydroquinone developer containing sodium hydroxide to increase the pH, sodium thiocyanate as an accelerator, and benzotriazole as an antifoggant to improve the final maximum density, was found to be a useful first developer. It required approximately 6 min. development at 80 F.

Further acceleration by the use of amine accelerators was possible but every compound evaluated caused excessive development of the top layer, resulting in loss of yellow—hence, a very blue color balance.

Two-bath development, in which the alkali and developing agents were in separate baths, was investigated. Once again, the first developing time was reduced but a blue color balance was produced.

The effect of the three major classes of wetting agents

was determined. No useful result was obtained because the wetting agents either precipitated or were ineffective.

*Step No. 4—First Shortstop*

The only problem at this state was to find a shortstop which worked as rapidly as possible, had a good exhaustion life, and yet did not cause blistering. A sodium diacetate (solid addition product of sodium acetate and acetic acid) solution at a pH of 4.7 gave satisfactory shortstopping action in 1 min. at 80 F.

*Step No. 5—Wash*

If the black-and-white developing agents are not completely removed by an efficient wash, they will be reactivated in the alkaline color developer. This will cause a speed increase, a contrast increase, and a loss in maximum density and will also contaminate the color developing solution.

Washing for two minutes in a tank containing rapidly-moving water at 80 F is necessary in hand processing.

*Step No. 6—Color Development*

A color developing solution containing a non-irritating color developing agent and an aromatic amine[12] as a development accelerator, along with the normal alkali, restrainer and preservative, gave satisfactory color development in 4 minutes at 80 F.

This color developing time could not be decreased by further increasing the concentration of the color developing agent because the stain level became intolerable.

Increasing the alkalinity with sodium hydroxide, in an attempt to reduce the time required for color development, actually caused reduction in cyan density. Sodium carbonate at a pH of 10.35 was found to be the most useful alkali.

Sodium thiocyanate, a silver halide solvent, added to the color developing solution in an attempt to increase the speed of the reaction, caused serious degradation of the colors due to proximity development (production of unwanted dye in layers adjoining the one where the dye is desired).

*Step No. 7—Second Shortstop*

A solution of sodium bisulfite at a pH of 5.5 was found to be extremely useful as a shortstop at this stage because it eliminated the need for a washing step prior to bleaching.

Efficient drainage or squeegee action is necessary to prevent excessive carry-over of the bisulfite into the bleach where it is oxidized, causing a drop in pH of the bleach solution. If the bleach pH does fall appreciably due to this carry-over, the bleaching solution may produce blisters on the film and become more corrosive toward metal tanks.

*Step No. 8—Bleach*

A ferricyanide bleaching solution of approximately twice the normal concentration gave satisfactory silver bleaching action in 1 min., 45 sec. at 80 F. Further increases in the ferricyanide concentration had little effect.

Other silver bleaching solutions (bichromate, permanganate and copper sulfate) were investigated but found to be inferior to ferricyanide for this purpose.

TIME TABLE FOR RAPID PROCESSING OF ANSCO COLOR DAYLIGHT FILM

| | Standard (Temp. = 68 F) | Rapid (Temp. = 80 F) |
|---|---|---|
| Prehardener | none | 2 min. |
| 1st Developer | 16½ min. | 7 min. |
| 1st Shortstop | 1 min. | 1 min. |
| Hardener | 4 min. | none |
| Wash | 3 min. | 2 min. |
| Second Exposure | — | — |
| Color Developer | 16 min. | 4 min. |
| Color Shortstop | 1 min. | ½ min. |
| Hardener | 4 min. | none |
| Wash | 10 min. | none |
| Bleach | 6 min. | 1¾ min. |
| Wash | 5 min. | ¼ min. |
| Fixer | 5 min. | ¾ min. |
| Wash | 15 min. | 1½ min. |
| Total time | 86½ min. | 20¾ min. |

*Step No. 9—Fixer*

Ammonium thiosulfate was the most rapid fixer investigated and adequate fixation can be obtained in 45 sec. at 80 F.

*Step No. 10—Final Washing*

An efficient final wash is necessary to remove the various salts remaining in the film. This can be done in 2 minutes at 80 F in a tank, or even more rapidly if efficient spray washes are used.

*Step No. 11—Drying*

As the prehardened film is still reasonably hard at this stage, drying can be accomplished quite rapidly. The actual time required depends upon the dryer design.

## Conclusion

The aforementioned modifications in solutions and techniques have resulted in a 20 minute hand processing procedure for Ansco Color Daylight Film and one requiring but 16 min. for Ansco Color Printon.

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# DAYLIGHT COLOR VARIATIONS *and* COLOR PHOTOGRAPHY

R. H. BINGHAM AND H. HOERLIN*

ABSTRACT

The color of daylight varies according to the hour of the day as well as from month to month but few quantitative data on the magnitude of this variation are available. To obtain information of practical significance, the color distribution of natural daylight has been measured by determining its effect on the individual layers of color film. Photographs of a gray scale under natural daylight illumination were made at various times of the day and for different months of the year and subjected to controlled processing. Observations were made in Binghamton, Chicago, Dallas and San Diego.

The data showed a very close relationship to the angle of the sun above the horizon. At the latitude of Binghamton, New York, the experimentally measured color variations correspond to a color temperature change from 6500 K at noon in June to 5400 K in late afternoon in winter. Nearly the same color range was found to hold for all the four cities studied. Thus the test shows no evidence of a latitude effect other than that from the difference of solar altitude. Daylight color film designed for use at a color temperature of 6000 K will lead to acceptable results over the expected range from 5400 K to 6500 K.

THE color of daylight varies considerably from hour to hour during the day and from month to month during the year. In addition, there are obvious variations due to changing weather conditions. For example, on a partially or totally overcast day the light falling on a photographic subject is usually bluer than that illuminating the subject on a bright sunny day. Probably few individuals are more aware of these facts than the photographer who works with color film. This paper discusses a project which was carried out to obtain quantitative information on the color of natural daylight as it relates to color photography.

The relative amounts of energy present in daylight and sunlight at different wavelengths have been determined quantitatively in the course of scientific investigations by various workers. A review of the extensive literature will not be attempted but the following data from two sources will illustrate the point in question. Figure 1 shows energy distribution curves for pure sunlight, with skylight excluded, as published by Davis and Gibson[1] in 1931. One of these two curves shows the relative amounts of energy in sunlight at noon in June at Washington, D. C., while the other is representative of noon sunlight in December. These curves demonstrate the difference between the blue summer sunlight and the warmer winter sunlight. It should be noted that these data characterize pure sunlight. Daylight, as it illuminates a photographic subject, is a mixture of sunlight, sky light and light scattered from clouds and terrestrial objects. In general, daylight is bluer than the pure sunlight component because of the considerable contribution from the sky.

Figure 2 shows somewhat similar data published by Taylor and Kerr[2] of General Electric Co. in 1941. These curves, representing three phases of sunlight and daylight, perhaps come closest of any published data to telling the amount of color variation which color photographers may expect. The center curve shows the energy distribution of light falling on a horizontal plane on a sunny day. The upper curve is for an overcast day while the lower one is that of pure sunlight.

These curves, together with other similar published data, yield a reasonably good hint of the range of color variation to be expected. The conditions under which these measurements were made, however, are not typical of those that interest color photographers. For one thing, the color film registers the light selectively—it is more sensitive to certain wavelengths than to others. This fact suggests that, in order to determine those daylight characteristics which are of greatest importance in color photography, we should use color film itself as the measuring instrument. Also for photographic purposes other than aerial photography, the most significant measurement of color quality should be made for a vertical, front-lighted surface. We should have data on the color quality of this illumination for different times of day, for different months of the year and for different geographical locations. These considerations led to the formulation of a research project which was planned expressly to yield data on those color variations of natural daylight which are of particular importance for the design of color film and the sensitometric control of such a product.

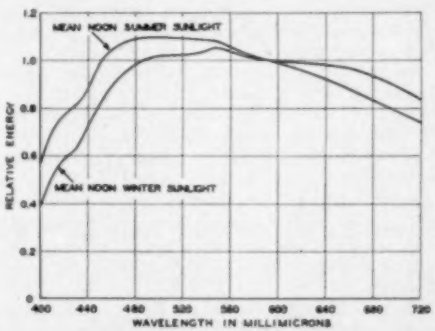


**Fig. 1. Relative energy distribution of noon sunlight at Washington, D. C. (Davis and Gibson[1]).**

## Procedure

The general method was to take a series of pictures of a gray scale chart under widely varying conditions, and to

* Ansco Research Laboratories, Binghamton, New York. Delivered at the PSA Convention, Baltimore, Maryland, 21 October 1950. Received 16 December 1950.

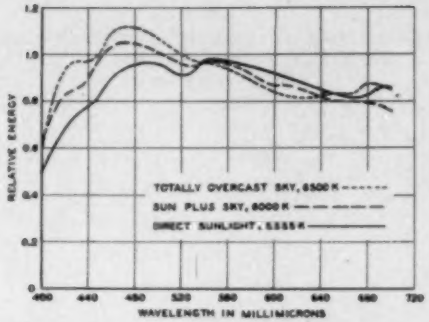


Fig. 2. Average energy distribution curves for three types of daylight at Cleveland, Ohio. (Taylor and Kerr 1941[5]).

process and analyze these pictures together with a number of identically exposed sensitometric strips. From measurements of the integral densities of the gray scale reproductions, the differences in color between various kinds of daylight and the standard light source in the sensitometer were computed.

The typical photographic setup which was used for the out-of-door exposures is illustrated in Fig. 3. An Ansco Titan f/4.5 camera with coated lens was used. The gray scale carried three steps carefuly selected for spectral neutrality. Pictures of the chart were taken on daylight type Ansco Color Film at 1/25 second exposure time with lens apertures at full stop intervals from f/5.6 to f/22. To reduce experimental errors, six rolls of film, that is, thirty-six pictures, were exposed in rapid succession. A typical day's run consisted in exposing in this manner, six rolls of film each hour from eight o'clock in the morning until five o'clock in the afternoon, thus making a total of fifty-four rolls for the day. For control purposes, all these rolls were processed together with six sensitometrically exposed

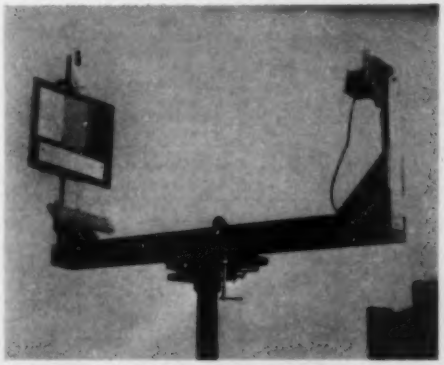

Fig. 3. The simple photographic equipment used for making outdoor exposures. The plumb bob hanging between the first and second gray patches was used to maintain the vertical position of the easel. The shadow of the spike (from which the plumb bob hangs) falling on the plumb line determined the 90° horizontal angle that was used throughout the series of tests.

rolls of the same emulsion number. The intensity scale sensitometer[3] used for exposing the controls operates at 1/20 second exposure time and employs a 2850 K light source with a filter[4] which accurately reproduces the energy distribution of 6000 K daylight.

By measuring the component color densities of the reproductions of the gray scale and comparing them with the densities of the standard sensitometric strips, the color of the light reflected from the gray scale was measured. The details of the method of evaluation were carefully worked out to make the results as independent of camera and film errors as possible. First, the three standard sensitometric curves were plotted from the averaged blue, green and red densities of all the sensitometric strips. A set of curves for one test, Fig. 4, shows blue, green and red densities as read on an Ansco Model 12 Color Densitometer. The color variations of daylight are indicated directly by the color density differences in the gray scale photograph and are independent of the exposure level. It is permissible there-

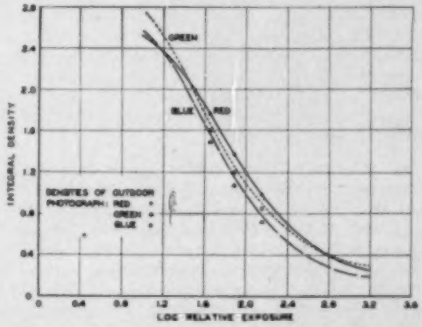


Fig. 4. Density readings, from outdoor photograph of gray scale, superimposed on corresponding complete sensitometric curves.

fore to equalize (superimpose) one of the outdoor picture curves with the corresponding standard sensitometer curve. Then the differences between the two remaining pairs of curves will show the distinction between the quality of the outdoor light and that of the sensitometric source.

The cyan layer, measured by red density readings, was selected as a basis for the evaluation. The procedure may be illustrated by an example in which a three-step gray scale photograph has the following densities:

| Step No. | Densities | | |
|---|---|---|---|
| | *Red* | *Green* | *Blue* |
| 1 | 0.95 | 0.73 | 0.84 |
| 2 | 1.36 | 1.08 | 1.20 |
| 3 | 1.78 | 1.50 | 1.60 |

Referring to Fig. 4, and assuming the red density curve for the photograph to be identical with that of the sensitometric strip, the green density 0.73 is plotted at the same log exposure level as the red density 0.95. The blue density 0.84 is plotted vertically above it. The points for the other two steps are plotted in a similar manner. This procedure is repeated for the remaining thirty-five exposures and leads to a complete plot of two outdoor characteristic curves.

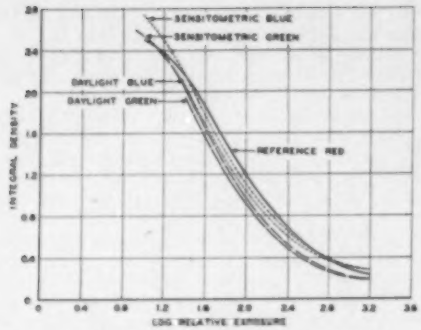


**Fig. 5. Typical curves of outdoor daylight plotted relative to the corresponding sensitometric curves.**

The resulting curves are shown in Fig. 5. The amount by which the color of the natural daylight differed from the sensitometric standard is measured in log exposure units by the horizontal distance between the blue curves in one case and the green curves in the other. In the example illustrated in Fig. 5, the blue curve shows a log E difference of —0.06 while the green curves differ from the sensitometric standard by —0.04.

Tests of this type were carried out in the vicinity of Binghamton, New York over a period of a year with a total of thirty-two hourly observations on thirteen different days between August, 1949 and June, 1950. In addition field tests were made at Chicago, Dallas and San Diego. In all, a total of fifty-nine hourly observations were made.

From the beginning of these investigations, the possibility was considered that the dominant factor influencing the variation of the color of daylight might be the solar altitude. It was uncertain, however, to what extent other climatic conditions might affect the color of the light*. As more data became available, it became evident that within the errors of the method, and assuming similar weather conditions, the color of daylight is the same at a given solar altitude, irrespective of the time of day and season of the year.

Jones and Condit[5] have published values of the solar altitude for various times of day for successive months of the year. These data which they computed for a latitude of 40° N are reproduced in Table I. In order to convert data of this table to any other latitude ($\lambda$) of the north temperate zone, it is merely necessary to add ($40-\lambda$) to all solar altitude values.

**Table I**

SOLAR ALTITUDE AT VARIOUS HOURS AND MONTHS AT LATITUDE 40° N.
(After Jones and Condit[5])

| | Hours before or after noon, local solar time | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| June<br>July | 73.4 | 69.1 | 59.8 | 48.8 | 37.4 | 25.9 | 14.8 | 4.2 |
| May<br>Aug. | 70.1 | 66.3 | 57.6 | 46.8 | 35.5 | 24.0 | 12.8 | |
| Apr.<br>Sept. | 61.3 | 58.4 | 50.9 | 41.1 | 30.1 | 18.7 | 7.2 | |
| Mar.<br>Oct. | 50.0 | 47.7 | 41.6 | 32.8 | 22.5 | 11.4 | | |
| Feb.<br>Nov. | 38.7 | 36.8 | 31.6 | 23.9 | 14.5 | 3.9 | | |
| Jan.<br>Dec. | 29.9<br>26.6 | 28.3<br>25.1 | 23.7<br>20.7 | 16.7<br>14.0 | 8.0<br>5.5 | | | |

## Results

The detailed results for Binghamton are presented in Fig. 6. On these graphs the measured differences of log exposure are plotted as functions of the solar altitude. The upper graph shows that, at the two extremes of twenty and seventy-five degrees above the horizon, deviations in log exposure are + .07 and — .05 respectively for the blue density curve. This means of course that a color photograph taken at a 20° solar altitude will be warmer than one taken at 50° and that the shift of the characteristic curve of blue density will be, on the average, 0.07 which is almost exactly a quarter of a lens stop. The corresponding shift of the green density curve will be about 0.03. Such a color shift would be expected at approximately two hours after sunrise and at about two hours before sunset.

At the other extreme, when the sun is at approximately 75° above the horizon, the daylight is bluer than the sensitometric standard by about 0.05 log exposure units when the densities are measured by blue light, and by about 0.03 measured by green light. Thus noon daylight in June is bluer than the sensitometric standard source by about one-sixth of a stop shift of the blue density curves.

The data for Chicago, Dallas and San Diego are shown in Fig. 7. For comparison purposes the diagonal lines representing the least-squares averages of the Binghamton data are included. It is evident that the data for all four cities

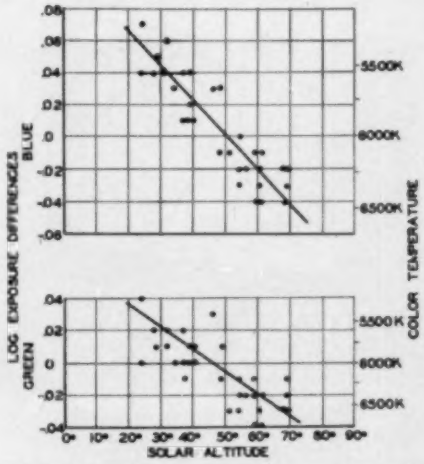


**Fig. 6. Color balance of daylight in log exposure differences at Binghamton relative to sensitometric daylight 6000 K.**

* It is realized that specific local characteristics like reflections from large bodies of water or snow, from lawns, shrubbery and trees or from colored walls of buildings, also effects of altitude above sea level, have to be excluded from our considerations.

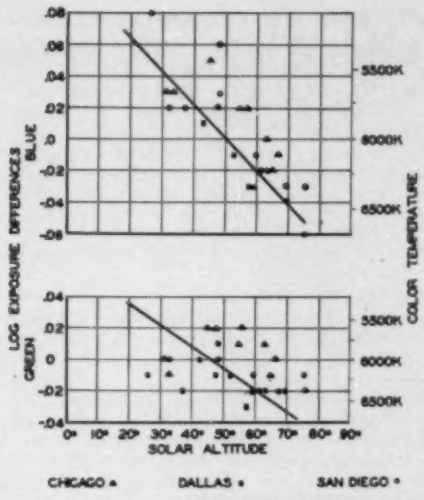


**Fig. 7. Color balance of daylight in log exposure differences for three cities relative to sensitometric daylight 6000 K. Average data for Binghamton, plotted as a straight line, has been superimposed.**

are in very good agreement. Assuming that these results are typical, it may be concluded that the principal source of variation of the color of sunny daylight is the angle of the sun above the horizon.

The data may also be summarized in a different way as shown in Fig. 8. In order to obtain this curve showing the color temperature of daylight as it depends upon the solar altitude, the log exposure differences were evaluated in terms of relative amounts of energy in the blue, green and red portions of the daylight spectrum. These values were then expressed in terms of color temperature. Note that this graph shows that when the sun reaches twenty degrees above the horizon—about two hours after sunrise—the daylight color temperature is 5400 K; at 50° above the horizon the color temperature is 6000 K. At a solar altitude of 70° representing the extreme limits of our measurements, the color temperature was found to be close to 6500 K.

An example of the application of these results in the case of Binghamton, Baltimore and San Diego is shown in Table II. At these latitudes on typical sunny days, at the indicated times, the light falling on a vertical, front-lighted subject is close to 6000 K.

These results are representative of clear, sunny days. For overcast days the data are less extensive. Nevertheless tests which we have made over a considerable range of solar altitudes show the color temperature of an overcast day to be approximately 6500 K. This color temperature, although at the upper limit, is within the range found for sunny daylight. These data confirm the Taylor Kerr findings (Fig. 2) obtained from photoelectric measurements.

From certain observations, it appears that industrial haze can cause a shift of as much as three or four hundred degrees toward a lower color temperature, particularly in the early part of the morning or latter part of the afternoon.

**Table II**

TIMES OF DAY FOR 50° SOLAR ALTITUDE

| City | Latitude | June 15 | | September 15 | |
|---|---|---|---|---|---|
| Binghamton, N.Y. | 42° | 9:15 A.M. | 2:45 P.M. | 12:00 Noon | |
| Baltimore, Md. | 39° | 9:00 A.M. | 3:00 P.M. | 10:45 A.M. | 1:15 P.M. |
| San Diego, Calif. | 33° | 8:30 A.M. | 3:30 P.M. | 9:45 A.M. | 2:15 P.M. |

### Applications to Color Photography

These studies are of considerable importance in the field of color photography for two reasons: first, they form a basis for the design and control of the manufactured product and, second, they contain seeds of good advice on the proper exposure of color film by the consumer. The data show that if color film is balanced to give neutral rendition of a scale of grays iluminated by light of 6000 K color quality, the same film may be used over a color temperature range from 5400 K to 6500 K with entirely acceptable results. Thus, since it is not practicable to make separate films, differently balanced for particular parts of this color range, it is satisfactory to balance to the middle of the range over which most pictures will be taken.

It is obvious that the best time to see, or to photograph, a sunrise is early in the morning. However, the great bulk of amateur color pictures demand faithful hue rendition of flesh-tones, sky, etc. Except for trick shots and attempts at special affects, the conclusions to be drawn from the above data are quite evident.

It follows that daylight color film which is balanced to 6000 K will yield optimum color rendition when used under front lighting conditions on a sunny day with the sun at approximately 50° above the horizon. Pictures taken on overcast days will tend to be about as bluish as those taken in sunshine at noon in June.

Of course, for the interested color photography fan, these suggestions come as a challenge and may well inspire interesting practical tests. To what extent will a thinly overcast sky in fall and winter compensate for the otherwise too low color temperature? Also, is there a period in late afternoon in summer when a thinly overcast sky

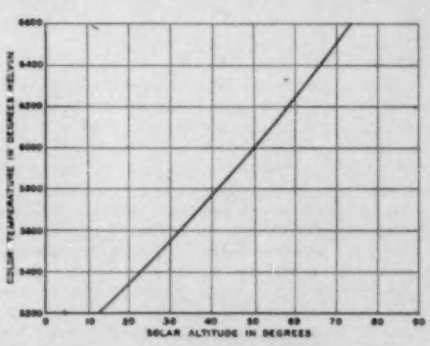


**Fig. 8. Color temperature of daylight as a function of solar altitude.**

will give good color rendition without the glaring effects of direct sunlight? These questions might also be interesting as they relate to the motion picture photography of babies and small children who often "don't like the sun". Considering also the existence of other local variables mentioned above, it would be difficult to settle these questions in a unique manner. However, the results of this work indicate the answers and may well serve the desirable purpose of tying together practical observations of color photographers generally so that they may all fit into an understandable pattern.

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## HOT, COLD, AND INSTANT START LAMPS

Photographers are sometimes confused by the terminology applied to fluorescent lamps. Ralph E. Farnham, APSA, of the General Electric Lamp Department, at Nela Park in Cleveland, Ohio has clarified the matter for Photographic Science and Technique readers in the following statement: "The first fluorescent lamps that we marketed required the external starter and one or two seconds were necessary for the cathodes to come up to temperature and for the starting switch to operate. We now call lamps of this type *preheat fluorescent lamps* as contrasted to the instant-start lamps of which the *slimlines* are typical examples.

"Obviously, the preheat fluorescent lamps are of the *hot cathode* type, since the cathode must be brought up to temperature before the lamp even starts. The cathode then remains at a fairly high temperature because of the arc spot.

"In the case of the slimline lamps, we apply a rather high voltage, 450 and upwards, which is sufficient to immediately strike the arc. The temperature of the arc spot then keeps the cathode hot during operation so that a slimline lamp may be considered as a *cold cathode* start, and a *hot cathode* operate lamp.

"The third group of fluorescent lamps, as well as all neon signs, have rather large cathodes; thus, they are cold cathode start and cold cathode operation lamps. The term 'hot' and 'cold' cathode does not accurate differentiate the instant start fluorescent lamps from the preheat types."

# VOLUNTARY PROTECTION OF TECHNICAL INFORMATION*

*The Secretary of Commerce requests that the details of this announcement be given the widest circulation through the associations, organizations, and publications with the means to reach those who possess strategic technological information.*

Secretary of Commerce Charles Sawyer has provided a service to help the public guard voluntarily against the harmful release of technical information, even though it is not subject to formal security restrictions.

The Office of Technical Services of the United States Department of Commerce will receive requests for advice as to whether specific technical data should be disclosed, withheld, or given limited distribution. OTS will obtain expert opinions from the interested departments and agencies of the Government and inform the inquirer accordingly.

As an industrialist, businessman, scientist, public official, or private citizen, you are invited to use this service whenever you question whether technical information in your possession should be disclosed. It is then entirely up to you whether or not you act on the Government's advice. There is absolutely no compulsion for you to do so, since the program is entirely a voluntary one.

Requests for advice concerning the release of technical information, together with pertinent manuscripts, plans, or documents, if they are available, should be addressed to:

Office of Technical Services,
U. S. Department of Commerce,
Washington 25, D. C.

Your enclosures will be returned with the Government's comment as promptly as compatible with the problems of fact and judgment involved.

Before inquiries are submitted, the information in question should be considered in the light of the types of technical data and the circumstances with which the program of voluntary protection are concerned. These are discussed in the following.

### The Problem and the Need

The Government is fully aware of the dilemma presented by any limitation, even though voluntary, on the

*U. S. Department of Commerce, Washington, D. C. January 1951. Received 20 February 1951.

flow of information among private citizens. Free exchange of information contributes to rapid progress in science and industry. On the other hand, all major powers depend on published data for a great share of their strategic intelligence. The present state of emergency, therefore, has directed attention to the security implications of imprudent release of technical information.

The Nation's interests can and should be served by voluntary protection of strategic technical information by private individuals and organizations. The program of voluntary protection is directed toward technical information which, if disclosed, would weaken the total position of the United States more than strengthen it.

### What Information Is Affected?

The program of voluntary protection is not primarily concerned with information which is "classified" as restricted, confidential, secret, or top secret by the United States Government. Unauthorized disclosure of such information is forbidden under penalty of law. If a question exists whether certain information is classified, however, this OTS service is available to obtain specific advice.

The program *is* primarily concerned with unclassified technical information and industrial and commercial information of a technological nature. Information falling within the scope of the program includes unclassified technical data on:

*Advanced* industrial developments.
Production "know-how" and technology.
Strategic equipment.
Special installations.

Circumstances in which voluntary protection is invited are somehow broader than indicated by this listing. The public itself, through inquiries which already have been made of various Federal agencies, has showed its awareness of the dangers of divulging certain information. Those inquiries illustrate certain categories of information regarding which the advice of the Government can prudently be sought:

#### Collection of Data Which Individually Might Have Little Significance

A major oil company wanted advice on whether to publish a booklet showing the location of its storage facilities throughout the world.

#### Information Requested Under Unusual or Suspicious Circumstances

A supplier of ordnance received a questionnaire from a broker with respect to his facilities for performing Government contracts. The questionnaire appeared unnecessarily detailed for its stated purpose.

#### Technical Information as Yet of Limited General Knowledge

A maker of electronics equipment asked whether a proposed radio broadcast on technological aspects of his products would be a security violation.

Inquiries may also be made on the extent of release which may be desirable. For instance::

Should the information be given only limited distribution?

Should part of it be distributed if part is withheld?

What distribution could be considered prudent?

### How the OTS Serves

The Office of Technical Services, John C. Green, Director, was designated by the Secretary of Commerce to serve as a clearing house in the program of voluntary protection of technical information because of its experience in publishing technological information developed in Government agencies or obtained from other countries. For some time OTS has acted unofficially as a clearing house for miscellaneous requests of the types contemplated under this voluntary program.

In conducting this service, OTS will refer inquiries to one or more agencies expert in the particular field, assemble the comments, and forward the Government's advice together with any original materials submitted by the inquirers. But under no circumstances is a person who requests guidance required to accept the Government's advice regarding disclosure of unclassified information. Each individual possessing knowledge or information is the final judge of how best to serve the public interest.

It will not be possible to provide instantaneous service, but all inquiries will be answered promptly within the limitations imposed by problems of fact and judgment.

### Whom the Program Serves

Representatives of private enterprises and other organizations, State and local officials, and private individuals are invited to utilize the OTS service in protecting unclassified technical information.

### Regular Contacts

Nothing in this program is meant to stop industrialists and others who have regular contacts in the Government from using their usual channels when questions of security and the public interest arise. The Department of Commerce service, rather, makes it possible for persons who do not have direct contacts to obtain expert guidance from the Government on matters involving strategic technical information.

### Scientific and Technical Journals

It is not contemplated that persons in a position to release unclassified technical information will normally call on OTS for guidance regarding release to known representatives of recognized scientific and technical journals, radio networks, press associations, and newspapers. Most of these organizations have wide experience in safeguarding such material. However, the service will be available to both the editor and the source of the material if they desire to use it.

### Export of Technical Data

The program of voluntary protection centering in OTS is concerned with information for release within the United States, which amounts to publication to the world. A separate service for the guidance of persons transmitting unclassified technical information directly to other countries is provided by the Office of International Trade of the Department of Commerce.

A special unit of OIT clears inquiries on the security implications of exporting unclassified technical data on *advanced* developments, technology, and "know-how"; on prototypes of such developments; on special installations; and on arms, ammunitions, and instruments of war which do not have security classifications.

# INDICATOR DYES FOR SHORT STOP BATHS

CARLOS JULIO RISSO-DOMINGUEZ*

DIFFERENT MANUFACTURERS of prepared photographic chemicals introduced a new constituent in short stop baths some time ago. This is *indicator dyes* which change the color of the entire bath to show when this acid solution is exhausted. Despite the fact that pH indicator dyes are rather well known to the chemist, photographic formulas containing them have not been widely published. Formulas using indicator dyes have not, of course, been fully discussed in the photographic literature. Up to this time photographic people only know that this or that manufacturer supplies a certain short stop bath that changes its color with the exhaustion of the acid.

It is obvious how important it is for amateurs in their darkrooms as well as for professionals in their photographic or motion picture processing laboratories to control the life of the short stop bath.

A pH meter is beyond the possibilities of most photographic workers and its use will not be logical as pH indicator dyes offer such great advantages and facilities which could not be expected from any other feasible method. These dyes yield results of great accuracy which are not even required from the photographic point of view. The convenience and economy which these give us are only two of their qualities which cannot be overlooked and which make them useful in the photographic laboratory. The color change of the solution, or of the drops which fall in the bath, or of strips of paper immersed in the baths, etc., being evident under the safelights, provides the surest way of knowing that the short stop bath should be discarded.

## Indicator Dyes for Photographic Use

The modification in the structure of pH indicator dyes and the corresponding change of color takes place within a limited pH range, and is many times shown by shades in between those colors that are formed at both ends of the pH range. A great many pH indicator dyes are known, and also many of them have been placed on the market by manufacturers of laboratory chemicals. These cover a great variety of pH ranges. A dye should be selected having a noticeable change of color in a pH range that corresponds to the variation in acidity of the short stop bath which we want to know. According to this we should seek those having a pH range ending in a value of approximately 5. Many indicators fulfill this requirement. We can also select a Universal indicator consisting of a solution with several dyes that is able to show, by passing through many colors, a complete pH range. Highly pure products are not essential for the use we intend to give them. There are two dyes of low cost and supplied in a degree of purity that makes them advisable for use as indicators for acid short stop baths, with a very interesting pH range that suits our object. We refer to the Sodium tetra-azo-diphenylnaphtionate or Congo Red with a pH range of 3.0 to 5.0 and to the Sodium alizarinsulfonate or Alizarin Red S, with a pH range of 3.7 to 5.2 (yellow to pink). The color change of the Congo Red with the specified pH range is from blue (acid) to red (very low acidity or alkaline). This indicator is well known and largely used, especially as test papers.

The Sodium alizarinsulfonate is an interesting indicator which will assist us in those cases when Congo Red has no utility, being used in prepared short stop baths that have been marketed by some manufacturers. Its change of color is from yellow (acid) to pink (low acidity), ending finally to violet (alkaline). These are the best indicators to test short stop baths. Both help us in accordance with the way the tests are made, as we will see later on. These two dyes are very soluble in water, and concentrated aqueous solutions can be prepared for use as stock solutions that enable us to make any kind of tests according to the different needs, e. g. to use directly in the baths, as drops testing the solution in test tubes, or for making test papers. They also have very low staining properties on films or papers. The use of them results in a great economy, even in those cases when used on a very liberal basis. This is due mainly to the low cost of these dyes.

The formulation with these dyes is simple. We suggest the following formulas:

INDICATOR FORMULA CJRD #1-1

| | |
|---|---|
| Water | 400.0 cc |
| 10% aqueous solution of Dibutyl phenylphenol sodium disulfonate* | 100.0 cc |
| Congo Red | 4.0 g |
| Borax | 0.5 g |

This formula is specially designed to prepare test papers. Congo Red test papers are paper strips impregnated in a solution of this dye, such as the mentioned formula, which, being introduced in aqueous solutions with different values of pH, show the same color change as the dye itself. This is a very easy method, but not as rapid as the drop method using formulaes I-2 and I-4. Strips of Congo Red paper are made by introducing sheets of paper in a solution of the mentioned dye, and once that they have been adequately dried they are then cut to the desired sizes. To make, a very good quality of paper, such as filter paper, is not necessary for photographic use in common practice. This formula is only for photographic use.

A test strip immersed in the stop bath becomes a bluish-violet color if the acid bath is found with a pH value corresponding to its highest degree of acidity. The strip which due to its blue color seems to be almost black under the red lamp will become paler and will disappear from

* Buenos Aires, Argentina (Azcuenaga 1872). Received 30 October, 1950.

* This compound is a wetting agent available from Monsanto Chemical Co., under the trade name "Aresklene 400".

our sight when the bath is exhausted. When introducing the paper in the bath, if the change from red to blue is not so rapid as in the case with a fresh solution, the bath has a very poor activity. If the change is very slow or does not occur, the bath should be discarded.

It is possible to use this formula and simple solutions of Congo Red in water to test short stop baths by adding drops to the bath and seeing the change of color. But the drops have a greater specific gravity than water and short stop baths. Also they have a very slight diffusion value. They fall to the bottom of the trays, tanks, etc., and they expand forming ring figures. They may stain prints in this concentrated form, and also in some cases it is necessary to agitate the bath or test tube to know exactly the color change. We overcome this difficulty by changing the physical properties of the solution. When a more rapid testing is needed, we suggest the following formula where the 1-methoxy-2-propanol modifies the physical characteristics of the drops, producing a strong diffusion of the dye in the water surface and an instantaneous change of color.

INDICATOR FORMULA CJRD #I-2

| | |
|---|---|
| 1-Methoxy-2-propanol* | 410 cc |
| Water | 90 cc |
| Congo Red | 1 g |

*The propylene glycol methyl ether is available from The Dow Chemical Company under the trade name of "Dowanol 33B".

It is necessary in this case to release the drops very near to the water surface. When the drops touch the bath surface, blue arborescent figures are instantly formed due to this diffusion in the surface. If the solution is exhausted, no noticeable change exists under red safelight. Truly the most safe and neat method to test short stop baths is to use formula I-2. However the Congo Red formulas have one disadvantage; it is only possible to test the baths under yellow, orange and red safelights, but not under green safelights.

A formula suggested for using the indicator dye permanently in the short stop bath and also in some cases to add as drops*, is as follows:

INDICATOR FORMULA CJRD #I-3

| | |
|---|---|
| Water | 300 cc |
| 1-Methoxy-2-propanol | 200 cc |
| Sodium alizarinsulfonate | 5 g |

To know the quantity of the stock solution that it is necessary to add in trays, tanks, etc., the worker should always test the amount of dye he plans to use under the darkroom conditions he will use to make sure that it does show up when the change takes place or in order that the color is noticeable under the safelight and with his laboratory conditions. To do this, the tray where the short stop bath is used should be filled with water rendered weakly alkaline with a small amount of sodium carbonate and, reproducing the same conditions, the necessary drops should be added until a darkening of the solution is noticed. This should be done with some agitation in order to insure that the dye is thoroughly diffused in all the bath.

A formula for instantaneous testing of short stop baths as in the case of formula I-2 but with Sodium alizarinsulfonate, is as follows:

INDICATOR FORMULA CJRD #I-4

| | |
|---|---|
| Water | 500 cc |
| Sodium alizarinsulfonate | 0.5 g |
| Diethanolamine | 4 cc |

With this formula for speedily testing the pH of the bath as in the case of formula I-2 it is necessary to follow a certain technique. From the dropping pipette it is necessary to release the drops at a distance of 1 meter from the bath surface. If the dark violet color of the drops does not disappear instantly when they touch the surface of the bath, the short stop bath should be discarded.

For several reasons each of these formulas and dyes is useful for different purposes. If we should be asked which of these is the most helpful for common photographic laboratory use, we should not be able to give a definite answer of a universal character. The suitableness in practical use of each of these formulas depends on the purpose for which it is required, and in order to find out which should be selected, we have to check the advantages of each.

### Color Change and Safelights

First of all, it should be borne in mind that while one has a darker color with an acid pH and Congo Red, the other dye, Sodium alizarinsulfonate, has in this case a clear yellow color. Inversely with a neutral or alkaline pH, Congo Red has a clear color and Sodium alizarinsulfonate a dark color. For the Congo Red, this is only true under yellow, orange and red safelights but not under green safelights. Formula I-2 and the Congo Red papers do not have any value in this case. Under green safelight the red color will be very dark, and the color change will be imperceptible. The change from yellow to violet of Sodium alizarinsulfonate is noticeable under all safelights, but it is necessary to remember that this dye has a great number of transition shades. From yellow it turns to yellowish-amber, from this to amber, from this to reddish-amber, from this to pink, from this to purplish-pink, from this to purple, and from this to purplish-violet. These changes of color show corresponding changes of pH over a wide range. For our interest, we need mainly to know the first change from yellow to pink, and this change is not well noticeable under red safelight. To overcome this disadvantage we have developed formula I-4 for using under all safelights. Following the above mentioned instructions, it is possible to test short stop baths with Sodium alizarinsulfonate as speedily as in the case of formula I-2. Here if the bath has some acidity, the color will change from violet to yellow. If not, the violet color will remain unchanged, and this is a safer method than to use formulas of Sodium alizarinsulfonate with changes from yellow to pink.

### Advantages and Disadvantages

To determine which is the most suitable method and dye in connection with each use, it is necessary to consider the three main ways to test short stop baths, which can be con-

* Using this formula by the drop addition method, it is necessary to modify the amounts as follows: Water 200 cc, Sodium alizarinsulfonate 0.5 g, and 1-Methoxy-2-propanol 300 cc. This is formula CJRD #I-3A.

sidered: (1) the dye is in the short stop bath permanently, (2) the dye is added in form of drops and (3) the dye stains a paper. In the first case it is only possible to use Sodium alizarinsulfonate, as using Congo Red permanently in the bath would prohibit viewing the prints due to the bluish color which seen under a red light is very dark. This dye is included following this method in some short stop baths with indicator that were marketed some time ago. The main disadvantage of this procedure is that the dye can stain the prints in some cases with a pink or violet color. As it does not compete with formulas I-2 and I-4, this way is suggested only for some cases of amateur use.

In the second case, the drop method, we have the most speedy and safe way of testing short stop baths, and we suggest following this in all cases of amateur, professional or motion picture use. Practically, formulas I-2 and I-4 have no disadvantages. However if the drops fall accidentally on papers or films, they can stain those photographic materials. The method using the drop procedure and testing the sample in another container has no disadvantages and we suggest this as the most safe, especially for motion picture and professional use. In the third case, only Congo Red is a suitable dye for making test papers. Using Congo Red paper strips, no possibility exists that the dye can stain prints or films. A very good way of determining the exhaustion of short stop baths is provided without the slightest risk. Unfortunately it is not as speedy as the drop methods using formulas I-2 and I-4. Test strips can also be placed in bottles storing the baths, and in this form guarantees us that, while it keeps its bluish-violet color, the bath can be used.

ACKNOWLEDGMENT

Acknowledgment is made to The Dow Chemical Company and to Monsanto Chemical Company for supplying kindly the mentioned chemicals of these companies to conduct the tests for developing these formulas.

# The Qualitative Determination of Metallic (Cationic) and Anionic Constituents of Photographic Scums and Sludges*

By R. W. Henn

SUMMARY

Scums on films and prints can often be identified by their appearance and solubility but specific confirmatory tests are desirable to determine the metals and anions present. Spot tests are the most readily applicable and may be performed on the film, or the scum may be dissolved and the reaction carried out on a "spot" plate. Aluminum is detected by (a) its amphoteric solubility, and (b) with alizarin or morin reagents; calcium with alizarin, oxalate, or picrolonic acid; chromium with diphenyl carbazide following oxidation; iron by ferrocyanide or thiocyanate; and silver with dimethylamino benzal rhodanine. Sulfite is detected by its bleaching action on diphenyl methane dyes, phosphate, by the molybdate reaction.

CONSIDERING the widespread occurrence of scums and sludges in the photographic process, particularly in systems subjected to extensive use, the literature on them is rather meager and almost the only substantial material is to be found in a number of papers by Crabtree and his co-workers. The paper "Scums, Sludges, and Stains," by Crabtree and Henn,[1] includes a general summation of the scums appearing during processing, together with their causes and removal, and some tests to aid identification, while the problem is treated more comprehensively in the booklet "Stains on Negatives and Prints."[2] Since the appearance of this article, a number of specific tests have been worked out and applied to the determination of the nature of numerous scums and sludges. From the viewpoint of the photographer, these tests may be complicated and involve substances well out of his usual experience, but most of the tests are reasonably direct analytical procedures and should offer no difficulty to the trained chemist if he familiarizes himself with the procedures and, in case of doubt or infrequent use, runs both a blank and a solution containing the ion in question, as controls.

Supplemented by a knowledge of the photographic process involved, of the general causes of scum formation, and by the information given by the appearance and solubility of the scum, these tests will aid materially in determining cause and prevention.

## A. Analytical Techniques

The quantity of material involved in producing a thin, but visible, film on the surface of a photographic material is very slight, and sensitive tests must be employed to produce equally visible reactions with this meager material. Colorimetric procedures are often of high sensitivity, and may be applied as spot tests, where the reaction is carried out in the volume of a few drops. Numerous tests and techniques are described by Feigl,[3] but not all of these are applicable to scum analysis.

When determining the nature of a sludge, the usual qualitative techniques for reactions in solution are often applicable and the reaction may be carried out in test tubes, adapting the size to fit the material available.

* Communication No. 1379 from the Kodak Research Laboratories. Received 8 December 1950.

If the quantity of sludge is very small, spot reactions are again pertinent, and it is usually most convenient to place a drop containing the sludge on a glass plate under a low-power microscope to observe the reactions. The material may be washed by centrifuging, and a small laboratory model holding 15 ml. centrifuge tubes will be found a useful tool in this type of analytical work.

Three general techniques are applicable to the scum analysis: (1) the reagents are spotted directly on the film, (2) the scum is dissolved in the reagent and transferred to the spot plate, and (3) clippings of the film are immersed in solutions of the reagents. The technique used will depend upon the necessity for preserving the image and upon the nature of the deposit.

(1) Spotting the reagent directly on the film has the advantage that the maximum quantity of reactant is present. Difficulty may be encountered with the propensity of reagents in solvents or alkalies to wet the gelatin and run over the surface, while the presence of an image will interfere with the observation of some reactions. The chance of damage to the image is, of course, great and the spotting should be confined to a waste film or to waste areas.

(2) Dissolving the scum and carrying out the reaction elsewhere is generally preferable. Most scums are soluble either in acid or alkali. Two drops of the solvent are placed on the film, smeared around to dissolve as much of the scum as possible, and a drop of the resulting solution is transferred to a spot plate or a piece of glass. The glass is often preferable because it is possible to see most of the reactions clearly under a lower-power miscroscope (20X magnification) by transmitted light. If the reagents wet the plate and spread, this procedure is not possible. Other reactions are best observed by reflected light. In some cases, small test tubes are conveniently used for carrying out the reaction even when only a few drops of reagent are employed.

(3) The third technique is to clip a margin of the film bearing the scum or an unimportant picture area from the film and either spot this, or bathe it in the reagents in question. This technique is preferred where the photographic material bearing the scum is of value, as is frequently the case. The whole problem of determining the nature of a scum upon such a film is delicate, and permission should be obtained from the owner before cutting or spotting the film. It is advisable to make a photographic copy before undertaking work on a valuable negative.

## B. Metal Constituents

### 1. Calcium

*Occurrence:* Calcium is precipitated in the developer where it may form a sludge, a scale on the tank walls, or adhere to the film as a scum. Depending on the ions present and the conditions of formation, it may be precipitated as the sulfite, carbonate, borate, or phosphate and may be a double salt such as $CaCO_3.Na_2CO_3.2H_2O$ or $CaO.3B_2O.12H_2O$.

*Appearance:* The scum has a white chalky appearance which may follow fingerprints or other areas where resistance to free diffusion has been met. The sludges and tank scales may be light gray to brown and black, depending on the presence of silver, oxidation products of the developer, or iron. The sludges and scales may be either compact or flocculent.

*Solubility:* The freshly formed scum is soluble in 10% acetic acid. On aging, the solubility decreases and older deposits may require 10% hydrochloric acid for solution, while it may be necessary to heat the acid to dissolve the scales completely. Calcium precipitates are insoluble in alkalies.

*Chemical Tests:* (a) *Oxalate.* The oxalate test is very reliable and sensitive, and may be applied to quantitative measurement. It is most adaptable to sludges and scales, where the washed precipitate is dissolved in 10% hydrochloric acid, neutralized with ammonia, heated and a 4% solution of sodium oxalate added. White crystals of calcium oxalate form slowly. The test is best carried out quantitatively* by adjusting the pH to the methyl red end-point with acetic acid and ammonia, heating, and slowly adding the oxalate. The precipitate is filtered, washed with a very dilute weakly acid oxalate solution, finally with water, dissolved in 10% sulfuric acid, and titrated hot with permanganate.

The oxalate test is applied to scums, by dissolving as much as possible in 2 drops of dilute hydrochloric acid, transferring 1 drop of this to a glass plate, and adding 2 drops of the ammonium hydroxide and 1 drop of oxalate.

(b) *Picrolonic Acid.* Calcium forms an insoluble, yellow, picrolonate salt which is applicable to scum determination. The scum is treated with 2 drops of 10% acetic acid; 1 drop of this is transferred to a glass plate, and 1 drop of the picrolonate solution is added. Yellow crystals of calcium picrolonate may be observed under low-power magnification.

It is necessary to run a blank with the reagent and acetic acid alone, because the reagent may crystallize under some conditions. The reagent cannot be further diluted, however, without decreasing the sensitivity of the test. Very large quantities of magnesium interfere, preventing precipitation and difficulty is encountered if hydrochloric acid has been used to dissolve the precipitate, even if this has been neutralized. Aluminum does not interfere.

(c) *Alizarin S.* The scum is dissolved with 2 drops of 10% hydrochloric acid, and 1 drop of this solution is transferred to a glass plate. Then 2 drops of 10% ammonia and 1 drop of Alizarin S solution are added. In the presence of calcium, a blue color appears, while crystals are visible under a low-power (20X) microscope. In the absence of calcium, the solution remains a clear red-purple. Aluminum does not interfere. This test has been adapted from that given by Snell,[4] by substituting Alizarin S for alizarin, since the alizarin sulfonate is also applicable to the determination of aluminum.

**Reagents:**

Ammonium oxalate, 4%.
Hydrochloric acid, 1:9.
Ammonium hydroxide, 1:9.
Methyl red, 0.2% in alcohol, or indicator paper appropriate to adjust pH to about 5.5.
Picrolonic acid, 0.26%. The picrolonic acid is dissolved in hot water, chilled to 40 F, and filtered. Refiltering may be necessary after standing.
Acetic acid, 1:9.
Alizarin S, sodium alizarin sulfonate, 0.1% in water.

* Mr. Henn has made a considerable number of quantitative determinations of the calcium in sludges and scales and has obtained information of benefit to him, hence this allusion in an otherwise qualitative paper. K. G., Ed.

*References:* The oxalate tests have been adapted from procedures given by Scott[5] (Vol. 1, p. 206), the picrolonic acid test and the alizarin test, from Snell[4] (pp. 465-466).

## 2. Aluminum

*Occurrence:* Aluminum is precipitated in the fixing bath and in the wash tank as the sulfite, phosphate, or hydroxide by interaction of the alum of the fixing bath with developer ingredients, or by hydrolysis in the wash water. It may occur as a sludge or as a scum.

*Appearance:* Except for the rare presence of foreign coloring matter, aluminum precipitates are essentially white. The sludges are uniformly flocculent, while the sulfite (or possibly phosphate) scum formed in the fixing bath may vary from a thin layer to a dense, white powdery deposit. Scum picked up in the wash water is in the form of discrete particles coagulated by organic matter, such as bacterial masses, and may be tan or brownish.

*Solubility:* Aluminum precipitates are characterized by solubility in both acids and alkalies. Scums may be appreciably soluble in reagents as weak as dilute acetic acid and ammonia, but hydrochloric acid or sodium hydroxide may be necessary to effect complete solution. Where organic material is also present, the residual skeleton of this will be noted on careful observation.

*Chemical Tests:* (a) *Solubility.* The amphoteric nature of the aluminum precipitates is probably the greatest aid to their identification. A scum is best spotted with sodium and ammonium hydroxides, hydrochloric and acetic acids. After standing about 2 minutes, the drops are washed off, the film is dried, and observed. Partial solubility will be noted in the weak reagents, more complete in the stronger. It is necessary to salt the sodium hydroxide solution with sodium sulfate in order to prevent the solution of the emulsion itself. Like all spot tests, much care must be exercised to avoid picture areas if the film is of value and, in this case, the tests are conducted with film clippings partially immersed in the reagent.

(b) *Morin.* The precipitate is dissolved in the sodium hydroxide solution and transferred to a spot plate. Then 1 drop of morin solution and 1 drop of glacial acetic acid are added. On the addition of the acetic acid, the brown hue changes to a yellow-green in the presence of aluminum. This lake of morin and aluminum is strongly fluorescent and glows brilliantly under an ultraviolet lamp. Holding a cobalt glass or a Kodak Wratten No. 35 Filter between the sample and sunlight is also effective in showing the fluorescence.

The test is extremely sensitive and will react to the aluminum retained by the film fixed in an alum fixing bath, regardless of scum. Where the scum follows a definite pattern, the aluminum may be detected by bathing a film clipping in the dilute acetic acid, then the morin, and observing the greater fluorescence along the pattern. It is very applicable to sludges, and the paper on which the sludge is filtered may be effectively spotted.

The test is not affected by calcium or chromium, and the acidity is not very critical.

(c) *Alizarin S.* This test is carried out very similarly to the morin test, by dissolving the precipitate in the sodium hydroxide, adding the alizarin, and then acidifying with glacial acetic acid. The purple color of the alkaline solution is replaced by a red color when acidified and, in the presence of the aluminum, a precipitate of the red alizarin lake.

Neither calcium nor chromium interferes with this test. The precipitate shows weak fluorescence. The test appears to be very positive, but is subject to the same objection as the morin test, namely, that the aluminum retained in the gelatin, independent of the scum, is adequate to produce a positive response.

**Reagents:**

Hydrochloric acid, 1:9.
Acetic acid, 1:9.
Acetic acid, glacial.
Ammonium hydroxide, 1:9.
Sodium hydroxide, 10 parts plus sodium sulfate 10 parts, water to 100.
Morin, 0.5% in alcohol.
Alizarin S, sodium alizarin sulfonate, 0.1% in water.

*References:* Morin test—Feigl,[3] page 113. Alizarin test—Feigl,[3] pp. 114-115; Snell,[4] pp. 259-260.

## 3. Chromium

*Occurrence:* As the sulfite, or possibly the hydroxide, formed in chrome alum stop baths and fixing baths as a scum or sludge.

*Appearance:* Light blue-green. Hue may be too light to form basis of identification.

*Solubility:* Soluble in dilute hydrochloric acid, less completely in sodium hydroxide.

*Chemical Test:* The following chemical test is indirect but very positive and is capable of detecting low concentrations of chromium. The scum or sludge is dissolved in dilute hydrochloric acid. A drop of this solution is transferred to a spot plate and the following reagents are added successively: bromine water; sodium hydroxide until the solution is alkaline; phenol, diphenyl carbazide; and sulfuric acid. The red color of the reagent changes to an intense blue-violet on acidification if chromium is present. Aluminum does not interfere. In this procedure, the chromium is oxidized to chromate by the bromine; excess bromine is taken up by the phenol. The chromate reacts with the diphenyl carbazide in acid solution to yield the blue-violet color.

**Reagents:**

Hydrochloric acid, 1:9.
Diphenyl carbazide, 1% in alcohol.
Bromine water, saturated.
Sodium hydroxide, 10%.
Sulfuric acid, 2N, about 3%.
Phenol, a 50% solution, or a small crystal of the solid.

*Reference:* Feigl,[3] pp. 98-99.

## 4. Iron

*Occurrence:* Iron is present in small quantities in numerous sludges and some scums. Rust spots of the hydrated oxide may be formed at any time in the processing procedure, including drying. Iron stains may be formed from toners and reducers, possibly as the blue ferri- or ferrocyanides. Iron may form coloring matter in various sludges, especially in those of biological origin.

*Appearance:* Iron spots, due to rust, etc., are usually a clear yellow to brown and free from the dichroism of similar silver spots.

*Solubility:* The iron spots will be dissolved or reduced by an oxalate solution acidified with hydrochloric acid. The blue intensifier stains are alkali-soluble.

*Chemical Tests:* (a) *Oxalate Bleaching.* The iron spots may be dissolved by treatment with a solution containing 5 parts of potassium oxalate and 5 parts of concentrated hydrochloric acid per 100.

(b) *Prussian Blue.* The spot is acidified with dilute hydrochloric acid and treated *in situ* with potassium ferrocyanide. The characteristic Prussian Blue hue is formed immediately, even when the iron concentration is very low.

(c) *Thiocyanate.* The spot is treated with dilute nitric acid and a drop of thiocyanate solution added. The appearance of the bright red of ferric thiocyanate serves for identification.

Iron is a relatively easy element to detect even in small quantities. In fact, detection of the presence of iron may not disclose the true character of the scum, since the iron may be merely coloring matter in a scum which is basically organic matter, calcium, etc.

**Reagents:**

Hydrochloric acid, 1:9.
Nitric acid, 1:9.
Hydrochloric acid, 5 parts plus potassium oxalate, 5 parts plus water to 100.
Potassium ferrocyanide, 1%.
Potassium thiocyanate, 1%.

### 5. Silver

*Occurrence:* An ion as common as this in the photographic process not infrequently forms a sludge, or scum, or stains the film. Silver stains are very often yellow to brown by transmitted light, but they are usually dichroic, with mirror-like qualities which serve to differentiate them from iron stains. Like iron, silver is frequently a coloring substance for organic scums.

*Solubility:* Silver dissolves slowly in sodium or potassium cyanide. It is much more rapidly dissolved by a mixture of ferricyanide and hypo. It is also dissolved by dilute nitric acid.

*Chemical Tests:* (1) *Chloride.* Silver in sludges may be detected by the usual qualitative procedure where the precipitate is dissolved in dilute nitric acid, and dilute hydrochloric acid is added. The white precipitate of silver chloride may be confirmed by dissolving it in ammonia, or it may be reduced to black silver by adding a photographic developer in sufficient excess to reach an alkaline condition.

(2) *Dimethylamino Benzal Rhodanine.* This is a sensitive reagent and will detect small quantities of silver as in a dichroic stain. The stain is first treated with a 2% potassium cyanide solution for about 2 minutes. A drop of this solution is transferred to a spot plate and a drop of the rhodanine reagent is added. It is then acidified with 1 drop of nitric acid. A red-purple precipitate of the silver dimethylamino benzal rhodanine is formed. The test is more sensitive if carried out on the film. The dilute nitric acid is a less active solvent than the cyanide but should produce a test if the reaction is carried out directly on the film.

Mercury and gold will not interfere in the presence of the cyanide and, although cuprous ions will react, they are very unlikely to be present. The silver of the image will, of course, also react if given sufficient time. However, dichroic silver stains dissolve more rapidly; and if it is possible to spot both a stained and unstained area, a much stronger test will be obtained in the stained area if the stain is due to silver.

**Reagents:**

Nitric acid, 1:9.
Potassium cyanide, 2% (poison).
Dimethylamino benzal rhodanine, 0.2% in acetone.

*Reference:* Feigl,[3] pp. 16-19.

## C. Anions

The detection of anions is of importance in ascertaining the cause of scums and sludges. Thus, establishing that a precipitate is calcium or aluminum phosphate rather than sulfite, will serve to indicate the presence of a phosphate, and possibly the breakdown of the polyphosphate sequestering agent used in many developers. In the case of aluminum precipitates, the sulfite is usually formed in the fixing bath while the hydroxide is formed in the wash water.

### 1. Sulfite

*Occurrence:* Sulfite is a common ion for calcium, aluminum, and chromium precipitates. The appearance and solubility are discussed under the various cations involved.

*Chemical Test:* The test for sulfite is based on the ability of this ion to bleach certain triphenylmethane dyes, such as Malachite Green or Basic Fuchsine, in weakly acid solution. The scum is dissolved in 2 drops of dilute hydrochloric acid, and spreading these over the surface to dissolve the maximum quantity possible increases the sensitivity. Then 1 drop of this solution is transferred to a spot plate, neutralized by the addition of 2 drops of sodium bicarbonate, and the lightly colored dye added drop by drop, with stirring after each addition. The sulfite present will bleach the dye, the number of drops bleached being proportional to the sulfite concentration.

This test is informative in that bleaching of the dye is a good indication of the presence of sulfite, but if the sulfite scum is quite thin, the bleaching of the dye may be too weak to detect. It is necessary to work with careful controls, a blank of the reagent, and a sample to which a drop of 0.2% sodium sulfite has been added.

Hypo, even in large quantities, does not bleach the dyes. Difficulty has been encountered in bleaching aged dye solutions, and these should be prepared fresh. The test will not work in strongly acid or alkaline solution.

Where an appreciable quantity of sulfite is present, as in a sludge or scale, the decolorization of iodine in acid solution may be used as an indication of the presence of sulfite. Thiosulfates will, of course, also reduce iodine.

**Reagents:**

Hydrochloric acid, 1:9.
Sodium bicarbonate, 10%.
A lightly colored solution of Malachite Green or Basic Fuchsine, prepared immediately before use by adding a few very small crystals to a few cc. of water.

*Reference:* Feigl,[3] page 201.

### 2. Phosphate

*Occurrence:* Calcium and aluminum phosphates may be formed if an orthophosphate is present in the developer, due to the addition of the phosphate as an alkali, or to the breakdown of polyphosphate sequestering agents.

*Chemical Tests:* The conventional molybdate test is applicable to the detection of phosphate in scums, even where the deposit is very light. If the destruction of the silver image is of no importance, the acid reagent may be added directly to the scum. In the presence of phosphate, a yellow precipitate will form inside the drop. If the attack of the reagent on the silver image is objectionable, the scum may be dissolved in dilute hydrochloric acid and transferred to the spot plate before the reagent is added.

The silver dissolved from the image does not interfere, nor does aluminum, calcium, or sulfite. In the presence of excess acid, molybdenum trioxide may be formed. This is much lighter in hue than the phosphate precipitate.

*Reagent:* A satisfactory molybdate reagent is that given by Lange[6] which is prepared by dissolving 72 grams of molybdenum trioxide in 75 cc. of concentrated ammonium hydroxide and 130 cc. of water; this mixture is then poured into a solution of 240 cc. of nitric acid and 500 cc. of water.

## D. Discussion

The chief reason for the analysis of scums and sludges is to prevent their recurrence. The work is greatly aided if the analyst is familiar with the tests and their limitations and with the photographic process and the most probable causes of sludge or scum formation. Familiarity with the tests may be obtained by trying them out first on a known solution before undertaking the actual analysis of the scum or sludge. For spot tests, a 0.2% solution of a salt of the ion in question (about 0.01 molar) is suitable for control purposes, 1 drop of this giving a reaction of the order of that obtained from the solution used to dissolve a small area of a moderately dense scum. A blank without the ion is also essential.

The conditions causing the formation of various scums are discussed in references (1) and (2). These conditions include an inadequately acid stop bath, insufficient agitation, use of exhausted solutions, and lack of cleanliness. Information which may be of value includes the nature and condition of the developer, stop bath, and fixer, the washing process, and wetting agents or other drying baths employed. Knowledge of the stage at which the scum occurs is invaluable. Analytical procedures will naturally be modified if phosphates are known to be present or if chrome alum stop baths or fixers have been used, as these are potential sources of scum, but they may be entirely innocent in the case at hand. If proprietary chemicals —packaged developers and fixers—are employed, the nature of the solutions is of course uncertain, but the chance of incorrect compounding is reduced.

The reagents employed are listed under the various analytical procedures. They may be obtained from chemical supply houses, while the special organic reagents are obtainable from the Eastman Organic Chemicals Department, of the Eastman Kodak Co., Rochester 4, N. Y. The reagents are most conveniently stored in 1 oz. dropper bottles, to be ready for use. The other equipment needed is fairly simple and much of it has been mentioned under the paragraph on technique. It includes a generous supply of small pipettes or medicine droppers, a white spot plate, small glass plates, filter paper, small test tubes, and a wash bottle, while a low-power microscope and a small laboratory centrifuge are desirable. Additional refinements may be obtained with micropipettes and special microequipment.

An analytical procedure for the examination of a scum is given in the following table. It is to be supplemented by a knowledge of the process employed and of the possible sources of the scum. It is not comprehensive, but includes those ions described in the body of this paper (which are the most common ones encountered in scums) and furnishes the preliminary information needed for the application of the appropriate specific test.

## E. Outline: An Analytical Procedure for Scums

**1. Physical Form**

(a) Continuous—formed by chemical interaction in the solution.
(b) Broken patterns—picked up from the surface or formed as immersed (before wet).
(c) Spots and discrete patches—picked up from the solution.

**2. White or Light-Colored Scums**

(a) Soluble in hydrochloric acid but not in sodium hydroxide. Check for calcium.
(b) Soluble in both hydrochloric acid and sodium hydroxide. Check for aluminum, and for chromium, if chrome alum is employed in the process.
(c) Water-soluble. May be crystallized hypo, residues from hard water, or wetting agents.
(d) Insoluble in above reagents. Probably organic matter, especially if discrete patches. May also be sulfur or oily deposits.
(e) Anions. If phosphate is present in the system, apply sulfite and phosphate tests.

**3. Yellow and Brown Stains**

(a) Soluble in acid oxalate. Test for iron.
(b) Soluble in ferricyanide-hypo. Test for silver.
(c) Observe for colorless residues. May be organic matter, calcium, aluminum, etc.

**4. Reagents for Solubility Tests**

Hydrochloric acid, 1:9 (1 part concentrated acid + 9 parts water).
Sodium hydroxide plus sodium sulfate, 10 parts each per 100.
Potassium oxalate plus hydrochloric acid, 5 parts each per 100.
Potassium ferricyanide plus sodium thiosulfate. Mix equal parts of 2% potassium ferricyanide and 10% sodium thiosulfate immediately before use.

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